HIGHLIGHTS

REVISION NO. 33 Jun 01/10

Pages which have been revised are outlined below, together with the Highlights of the Revision

CH/SE/SU C PAGES	REASON FOR CHANGE	EFFECTIVITY
CHAPTER 09		
L.E.P. 1- 1	Revised to Reflect this revision indicating new,revised, and/or deleted pages	
T. OF C. 1	Revised to reflect this revision	
09-11-00 1, 3, 5- 6, 11- 12, 18, 23- 29, 33, 35- 38, 40- 42, 44- 46, 49	Effectivity updated at the bottom of the page Minor additions and amplification **REVISED NOTE.**	

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CHAPTER 09

TOWING & TAXIING

LIST OF EFFECTIVE PAGES

N, R or D indicates pages which are New, Revised or Deleted respectively
Remove and insert the affected pages and complete the Record of Revisions and the Record of Temporary Revisions as necessary

CH/SE/SU	C	PAGE	DATE
RECORD OF TEMP. REVISION			
L.E.P.	R	1- 1	Jun01/10
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09-00-00		2	Dec01/90
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CHAPTER 09

TOWING & TAXIING

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TOWING AND TAXIING GENERAL

1. General

CAUTION : DO NOT TOW AIRCRAFT WHENEVER DIMENSION "H" EXCEEDS 300 MM (11.811 IN.) IN ORDER TO AVOID DETERIORATION OF NOSE WHELL CENTERING CAMS.

(Ref. Fig. 001)

A. Equipment and Materials

ITEM	DESIGNATION
Referenced Procedures	
- 05-57-00, P. Block 1	Aircraft Stability
- 09-22-00, P. Block 1	Taxiing or Towing with Tires Deflated
- 10-21-00, P. Block 1	Mooring

B. Towing the Aircraft

The aircraft may be towed by either the nose or the main landing gear.

- By the nose gear : normal towing on flat, hard ground.
- By the main gear : on soft, muddy ground.

The "taxiing" section deals essentially with the danger areas forward and aft of the engines.

Towing or taxiing with deflated tires. (Ref. 09-22-00, P. Block 1)

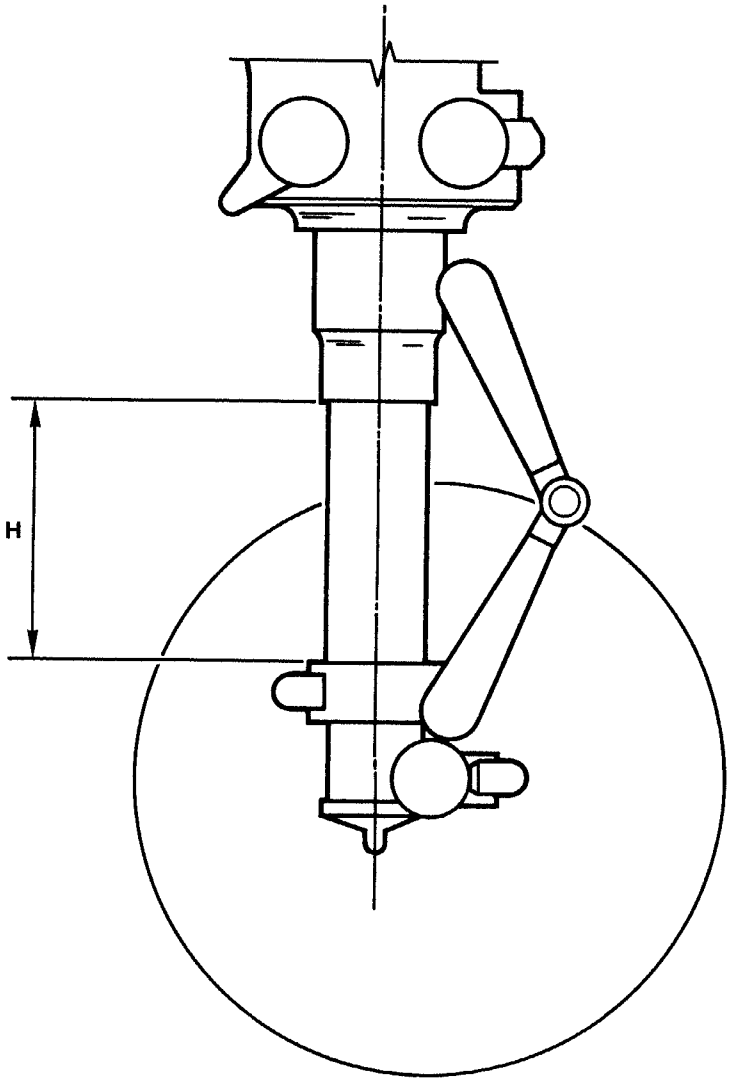
CAUTION : TOWING OR TAXIING THE AIRCRAFT WITH ENGINE COWLINGS OPEN IS SPECIFICALLY FORBIDEN DUE TO POSSIBILITY OF DAMAGE TO COWLS AND NACELLE STRUCTURE.
ALL COWLS (FAN, REVERSER AND CORE) MUST BE CLOSED AND LATCHED, PRIOR TO : TOWING OR TAXIING.

R ### C. Towing the Aircraft with one or Both Engines Removed

R The Aircraft may be towed with one or both engines removed but some precautions must be taken :

R

- before towing the aircraft, check the aircraft stability (Ref. 05-57-00, P. Block 1)
- for external storage, it is necessary to moor by the nose landing gear (Ref. 10-21-00, P. Block 1)
- it is possible to tow the aircraft with engine cowlings on, if all of them are closed and latched.



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Maximum Extension Of Nose
Gear Shock Absorber During Towing
Figure 001

1. Towing by the Nose Gear (Ref. Fig. 001)

WARNING : MAKE SURE THAT DURING THE TOWING OPERATION, NO PERSONS GO WHERE THE AIRCRAFT CAN CAUSE THEM INJURY.

R This procedure is for towing of the aircraft in maintenance configuration or
R to disengage the aircraft from the gate area (a push-back and then a forward
R tow without turns or multiple stops/starts).
R NOTE : Operational towing, i.e. towing an aircraft, loaded with
R passengers, fuel, and cargo, from the terminal gate or parking area,
R to a remote location is not permitted.

A. General

Two tow fittings are provided on the nose landing gear.
The front fitting is used for rearward pushing or forward pulling with the tractor placed in front of the aircraft.
The rear fitting serves for rearward pulling with the tractor aft of the nose landing gear under the fuselage.

NOTE : Towing by the nose gear is permitted with the engines at idle (ground idle).

NOTE : This procedure is for towing of the aircraft in maintenance configuration only and is not for operational towing.
Do not use a towbar tractor to tow the aircraft to a dispatch area near the runway threshold.

(1)Equipment and Materials

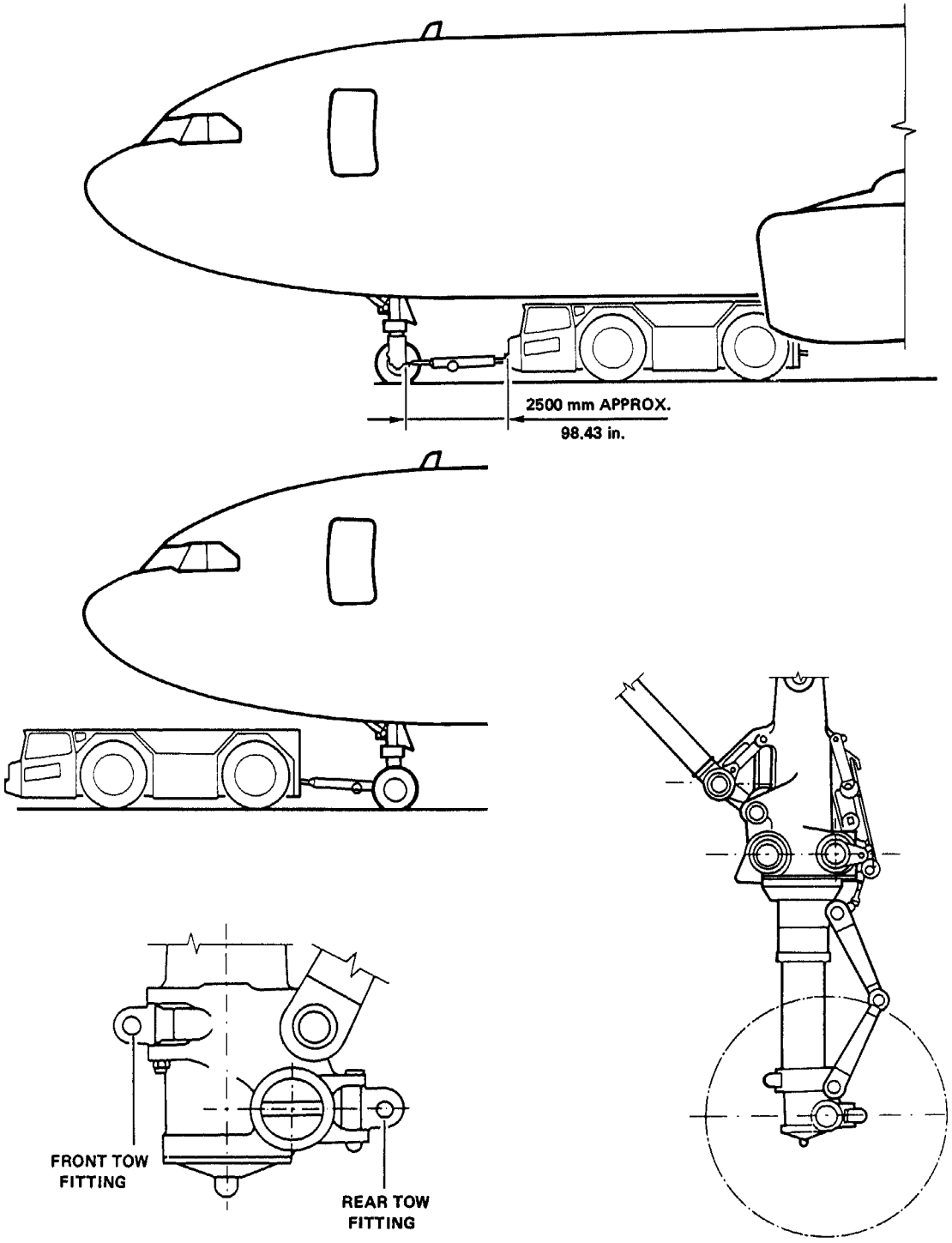
ITEM	DESIGNATION
(1)	Wheel Chocks
(2)D22333000	Ground Safety Pin MLG
(3)C23157-0-1	Ground Safety Pin NLG
(4)	Special tractor
(5)	Bar-Towing, Nose Gear Forward Fitting
(6)C22646	Safety Pin
Referenced Procedures	
- 05-57-00, P. Block 1	Aircraft Stability
- 24-23-00, P. Block 301	Auxiliary AC Generation
- 24-41-00, P. Block 301	AC External Power Control
- 29-23-00, P. Block 301	Yellow Auxiliary Power (Power Transfer Unit)
- 80-00-00, P. Block 301	Starting - General

(2)Towing forces (Ref. Fig. 002)

To push the aircraft rearwards with the engines at idle the engine thrust must be added.

**ON A/C 105-200,

Post SB 32-2068 For A/C 105-200,



Towing by the Nose Gear
Figure 001

(1)Equipment and Materials

ITEM	DESIGNATION
(1)	Wheel Chocks
(2)D22333000	Ground Safety Pin MLG
(3)C23157 100-1	Ground Safety Pin NLG
(4)	Special tractor
(5)	Bar-Towing, Nose Gear Forward Fitting
(6)C22646	Safety Pin
Referenced Procedures	
- 05-57-00, P. Block 1	Aircraft Stability
- 24-23-00, P. Block 301	Auxiliary AC Generation
- 24-41-00, P. Block 301	AC External Power Control
- 29-23-00, P. Block 301	Yellow Auxiliary Power (Power Transfer Unit)
- 80-00-00, P. Block 301	Starting - General

(2)Towing forces (Ref. Fig. 002)
To push the aircraft rearwards with the engines at idle the engine thrust must be added.

**ON A/C ALL

B. Precautions

R WARNING : OBEY THESE SAFETY PRECAUTIONS DURING TOWING PUSHBACK OR MOVEMENT
R OF THE AIRCRAFT.
R MAKE SURE THAT THE PATH OF THE AIRCRAFT IS CLEAR.
R MAKE SURE THAT NO PERSONS SIT OR STAND ON THE TOW BAR AND THAT NO
R NON-QUALIFIED PERSONS USE THE TRACTOR AS TRANSPORT. THIS IS TO
R PREVENT THE RISK OF INJURY.

WARNING : BEFORE POSITIONING THE NOSE GEAR ON THE TRACTOR, THE NOSE WHEEL STEERING SYSTEM MUST BE DEACTIVATED BY USING SAFETY PIN C22646.

WARNING : BEFORE POSITIONING THE LOCKING DEVICES, MAKE CERTAIN THAT THE LANDING GEAR IS DOWNLOCKED (Ref. 32-00-00, P. BLOCK 301).

WARNING : DURING TOWING/TAXIING OPERATIONS (LOW-SPEED OPERATIONS INCLUDED), EACH PERSON IN THE AIRCRAFT MUST BE IN A SEAT AND THE SEAT BELT MUST BE FASTENED.
IF THE SEAT BELT IS NOT FASTENED, THERE IS A RISK OF INJURY IF THE AIRCRAFT STOPS SUDDENLY.

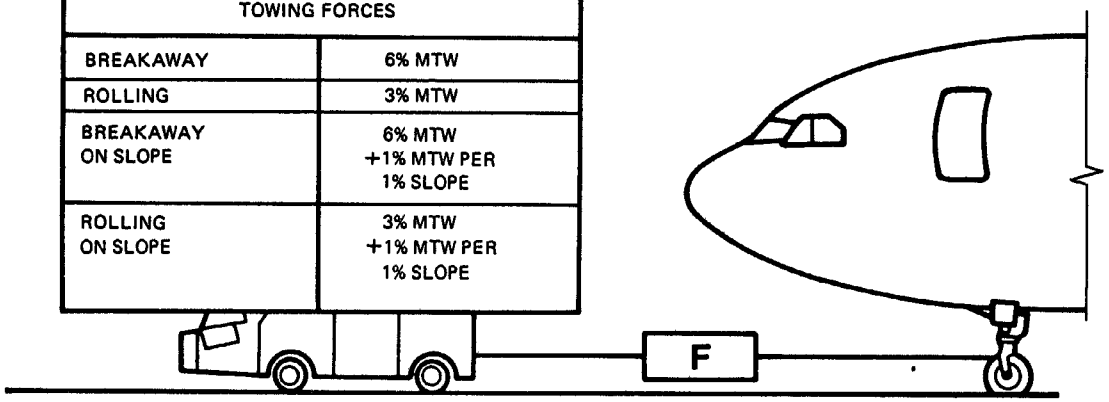
CAUTION : THE LANDING GEAR BRACE STRUT LOCKING DEVICES MUST ALWAYS BE FITTED WHEN THE AIRCRAFT IS ON THE GROUND OR BEING TOWED.
USE ONLY TOWING EQUIPMENT DESIGNED OR APPROVED BY THE AIRCRAFT MANUFACTURER.

CAUTION : TOWING THE AIRCRAFT WITH ENGINE COWLINGS OPEN IS SPECIFICALLY FORBIDDEN DUE TO POSSIBILITY OF DAMAGE TO COWLS AND NACELLE STRUCTURE. ALL COWLS (FAN, REVERSER AND CORE) MUST BE CLOSED AND LATCHED, PRIOR TO TOWING.

C. Towing Preparation

(1)Landing gear safety pins.

TOWING FORCES	
BREAKAWAY	6% MTW
ROLLING	3% MTW
BREAKAWAY ON SLOPE	6% MTW +1% MTW PER 1% SLOPE
ROLLING ON SLOPE	3% MTW +1% MTW PER 1% SLOPE



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DM5

Towing Forces
Figure 002

(Ref. Fig. 003)

**ON A/C 105-200,

Post SB 32-2068 For A/C 105-200,

(Ref. Fig. 004)

**ON A/C ALL

(Ref. Fig. 005)
(Ref. Fig. 006)
The landing gear must be mechanically secured in downlocked position during towing operation by inserting ground safety pins.
WARNING : WHENEVER THE GROUND SAFETY PIN IS INSTALLED ON THE NOSE GEAR TELESCOPIC STRUT ALWAYS VISUALLY CHECK THAT :
- IT HAS COMPLETELY AND EASILY ROTATED THE FORK-TYPE LEVER OF THE GROUND LOCKING SYSTEM.
- ITS STOP FLANGE ABUTS AGAINST THE HOUSING OF THE TELESCOPIC STRUT LOCKING SYSTEM (FULL INSERTION).

WARNING : WHEN THE GROUND SAFETY PIN IS REMOVED, VISUALLY CHECK THE DOWN POSITION OF THE FORK-TYPE LEVER ON THE TELESCOPIC STRUT GROUND LOCKING SYSTEM.

NOTE : It is optional to install the landing gear safety devices when you tow or push the aircraft during flight operations. (To put the aircraft in position for the flight crew at arrival or departure).

(2)Make sure that the aircraft is stable (Ref. 05-57-00, P. Block 1).

(3)Ground crew interphone box (Ref. Fig. 007)
For towing purposes the nose wheel steering system must be deactivated. This is carried out by a two position towing lever which must be set in the towing position and locked by a safety pin.

(4)Towing angles
- The maximum angle allowed on each side of the aircraft center line is 95° whatever towing arrangement is used (Ref. Fig. 008).

**ON A/C 105-200,

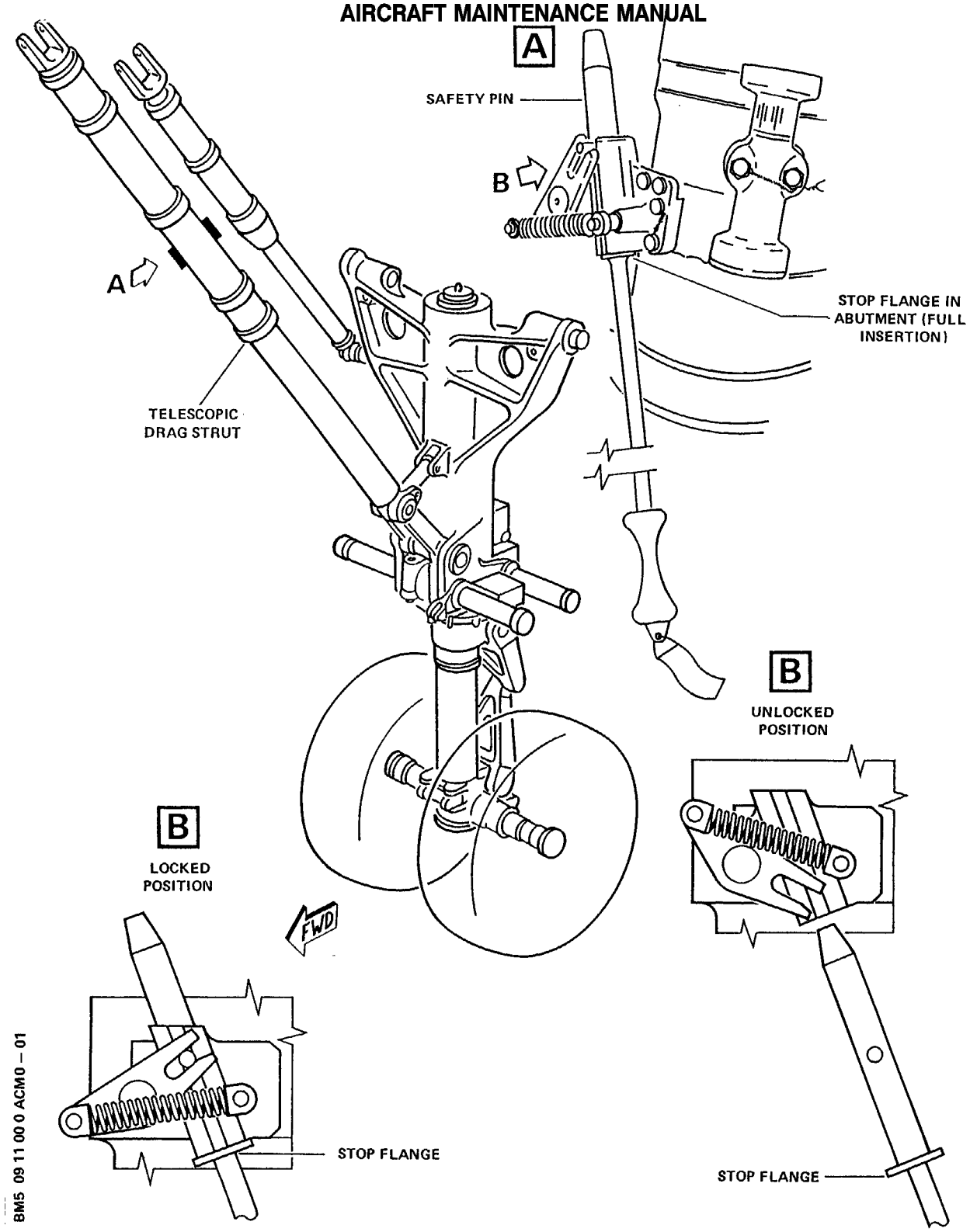
- During towing, the towing angle must not be more than the angle shown on the nose gear secondary doors.

**ON A/C 004-200,

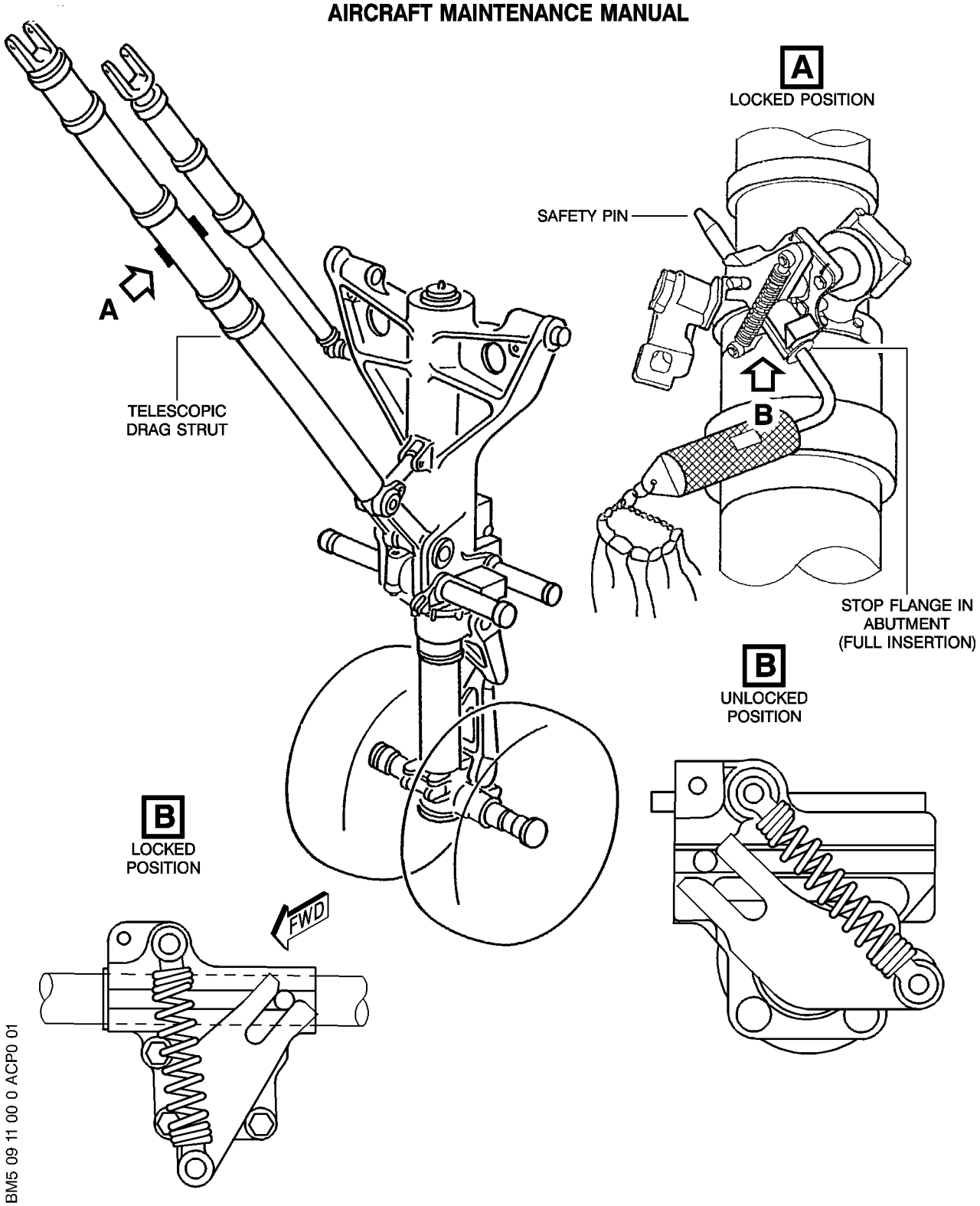
WARNING : IF AIRCRAFT WEIGHT EXCEEDS 158T, STEERING ANGLE IS LIMITED TO 65°.

**ON A/C ALL

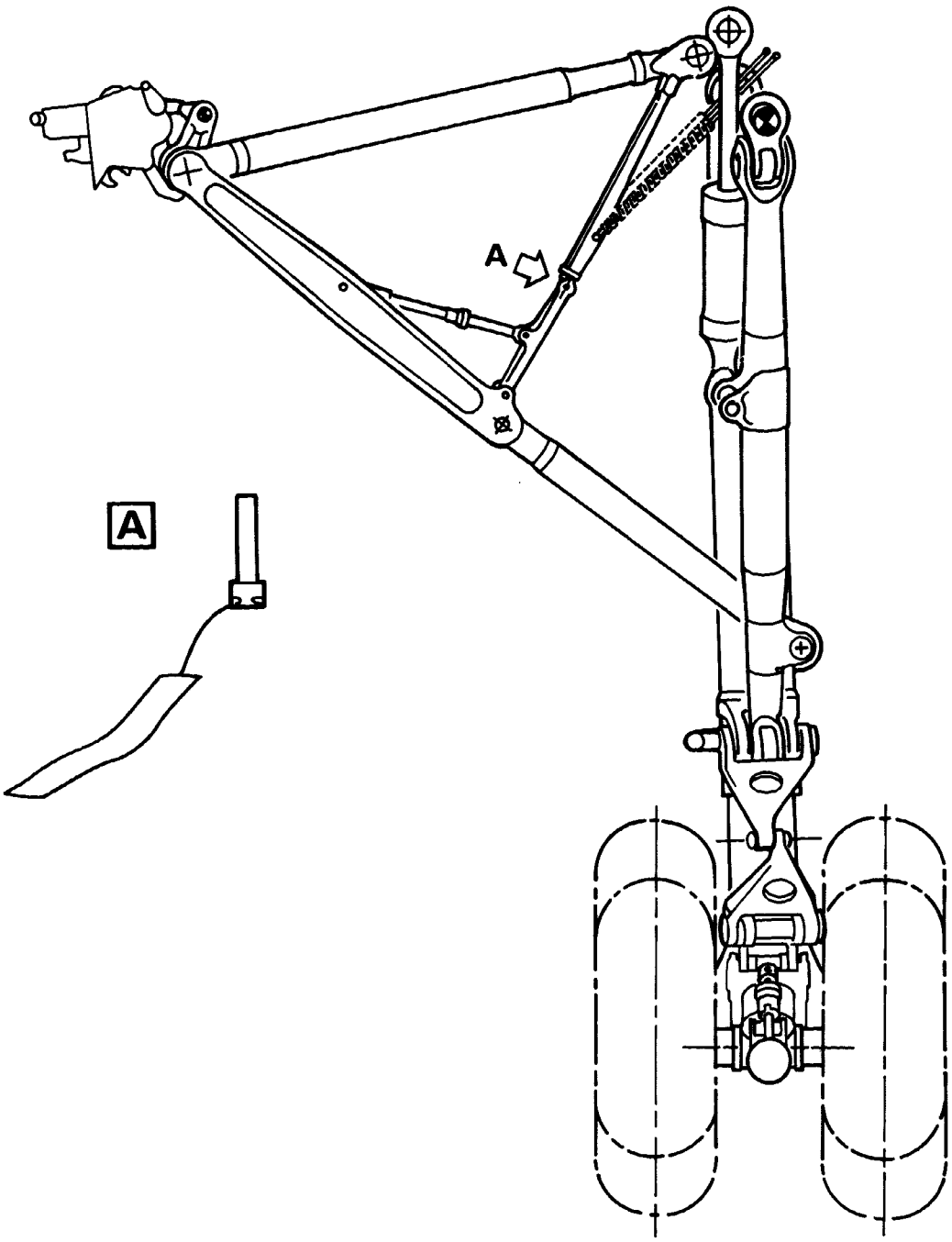
- Four fixed indicators are located on the nose landing gear. The center position is indicated by a forward and a rear slot.
Red marks indicate the 95° maximum steering angle (Ref. Fig. 008).



Nose Landing Gear Safety Pins
Figure 003



Nose Landing Gear Safety Pins
Figure 004



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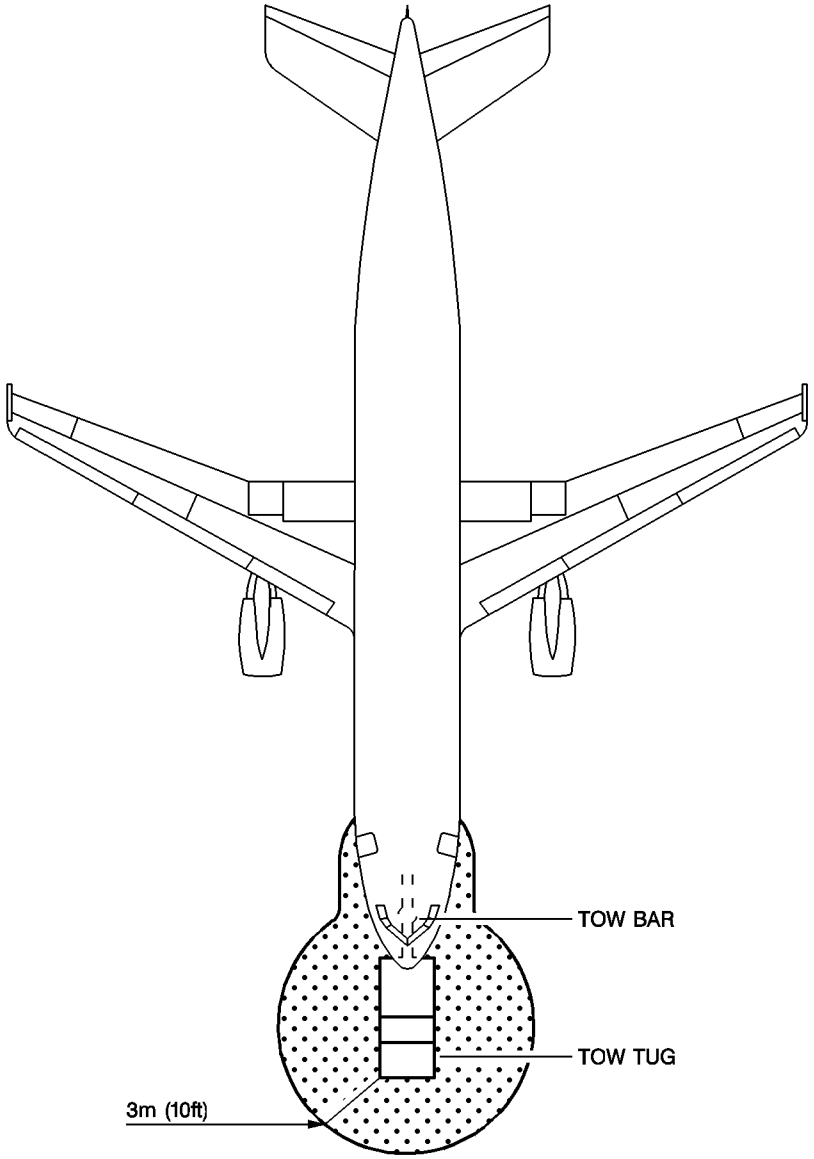
Main Landing Gear Safety Pins
Figure 005



NOTE : MAINTAIN A MINIMUM OF 3 METERS (10 FEET) SEPARATION FROM THE NOSE WHEELS, TOWBAR AND TUG WHILE AIRPLANE IS MOVING.

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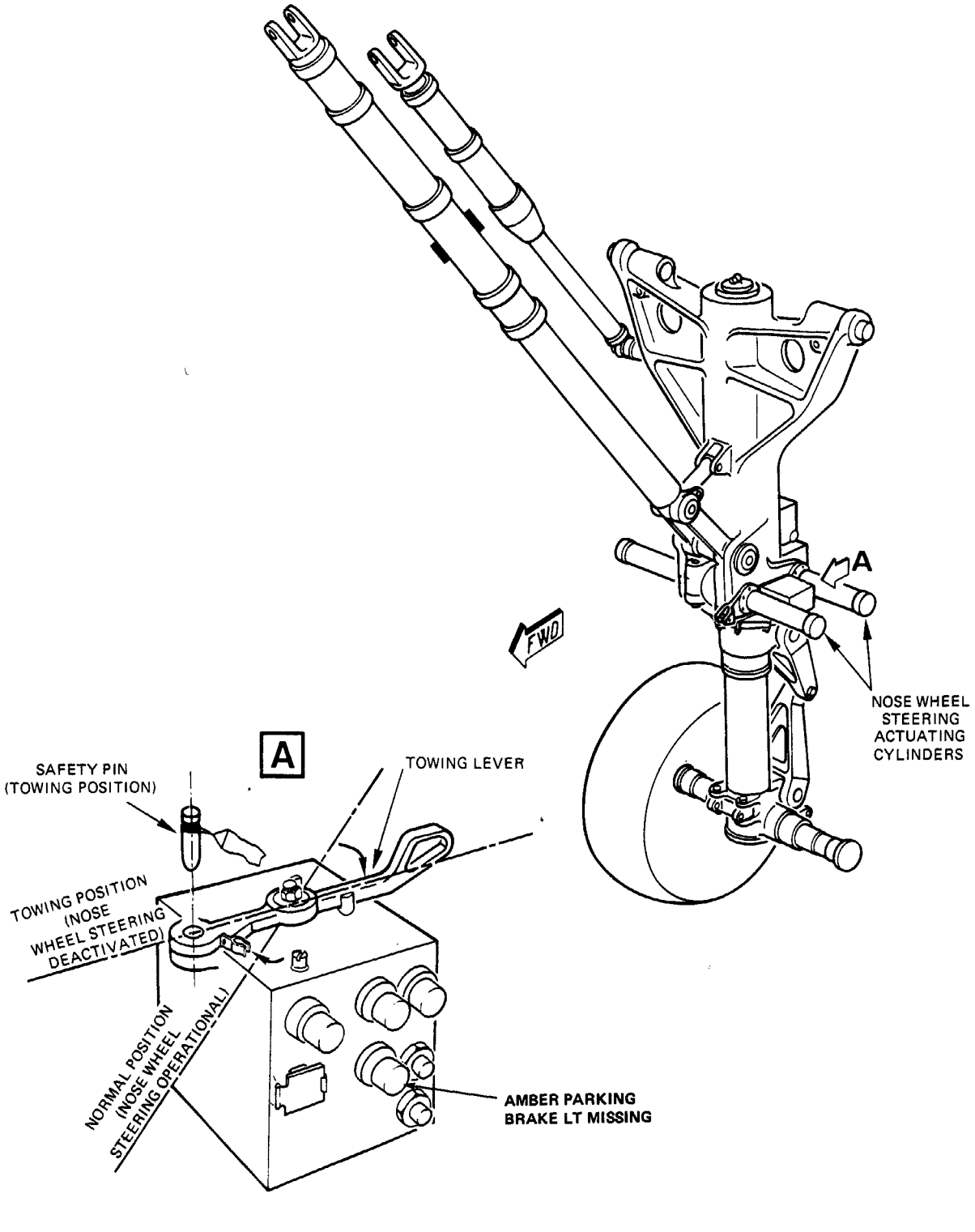
Towing - Hazard Areas
Figure 006



Interphone Box
Figure 007

- The steering angle is limited to 65° during rearward pushing using front fitting and engines at idle to avoid the tractor entering the engine suction area.

**ON A/C 101-200,

(Ref. Fig. 009)

**ON A/C 001-100,

(Ref. Fig. 010)

**ON A/C ALL

- This angle is restricted to 28° in case of rearward pulling using rear fitting, with tractor under fuselage, and engines idling. This is to respect minimum clearance between tractor and engine (Ref. Fig. 011).

(5)Towing loads.

(a)Towing load applied to nose gear must not exceed 16,555 daN. (37217.11 lb.ft).

(b)Ultimate shear strength of safety pins on towing bar is : 1750 m.daN. (12907.33 lbf.ft.).

(6)Energize the aircraft electrical network

During towing operations several aircraft systems have to be electrically supplied.

Before supplying the aircraft electrical network, the Cockpit Safety Check must be performed.

(a)With the tractor (if the tractor is equipped with a GPU) (Ref. Fig. 012)

- open access door 121EL
- connect a ground power unit provided on the tractor to a ground power receptacle located underneath the fuselage aft of the nose gear well
- energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Or with the APU

- energize the aircraft electrical network (Ref. 24-23-00, P. Block 301).

(c)Or with the engine

- start engine 2 (Ref. 80-00-00, P. Block 301).

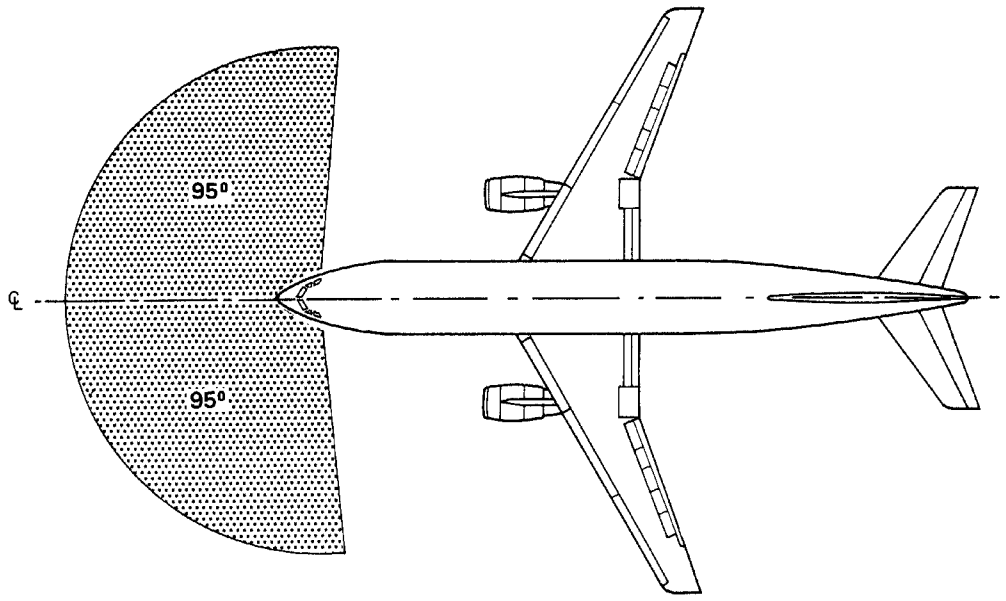
(7)Lighting System (Ref. Fig. 013)

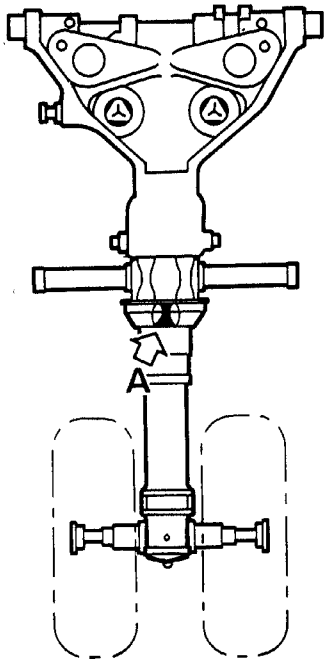
If necessary, the cockpit DOME lights must be switched ON.

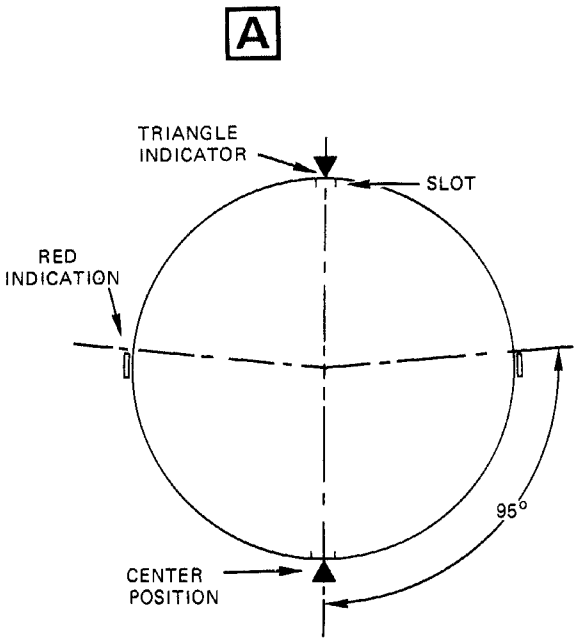
At night, if the anti-collision lighting is required by local airport regulations or by airline procedures the BEACON/STROBE lighting must be turned ON.

(8)Landing gear and brake system

- During towing maneuvers, one person shall be in the flight compartment in order to operate the brakes, if required.
- Before the breakaway, release the brakes and make sure that on the panel 4VU, the pressure indication on the yellow brake pressure triple indicator is correct (3000 psi (206 bars)). The pointer must be in the







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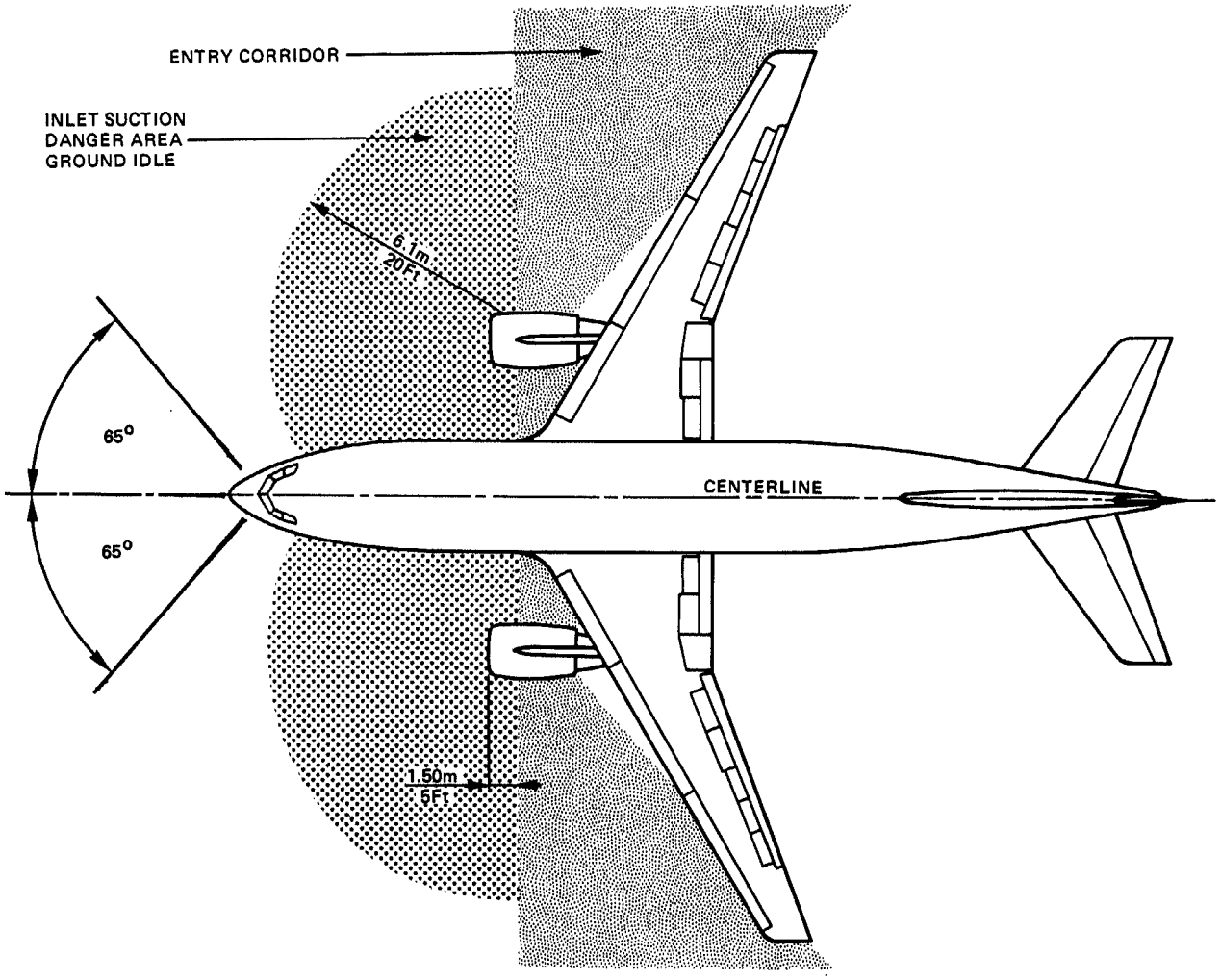
Towing Angles
Figure 008



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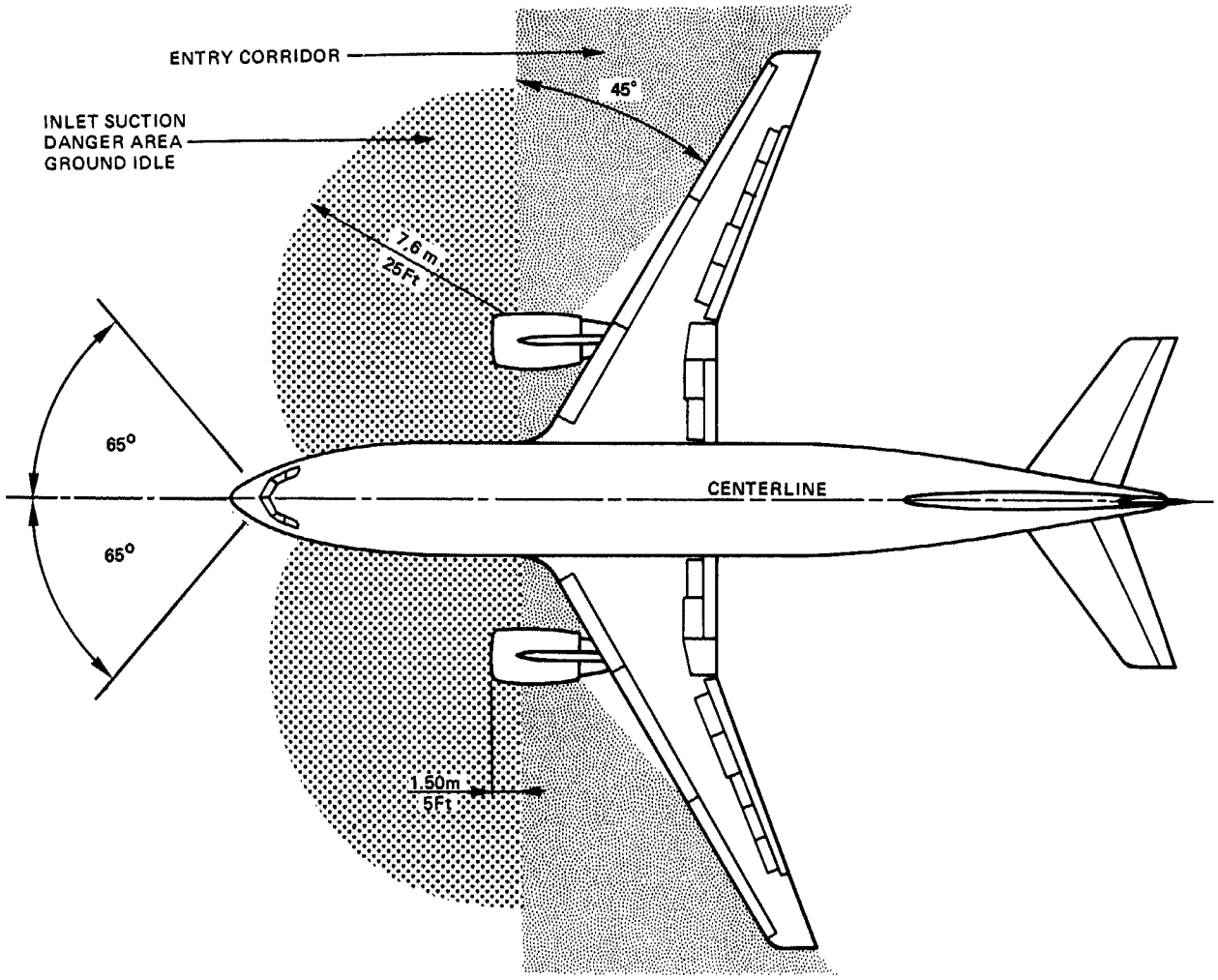
Towing Angles
Figure 009



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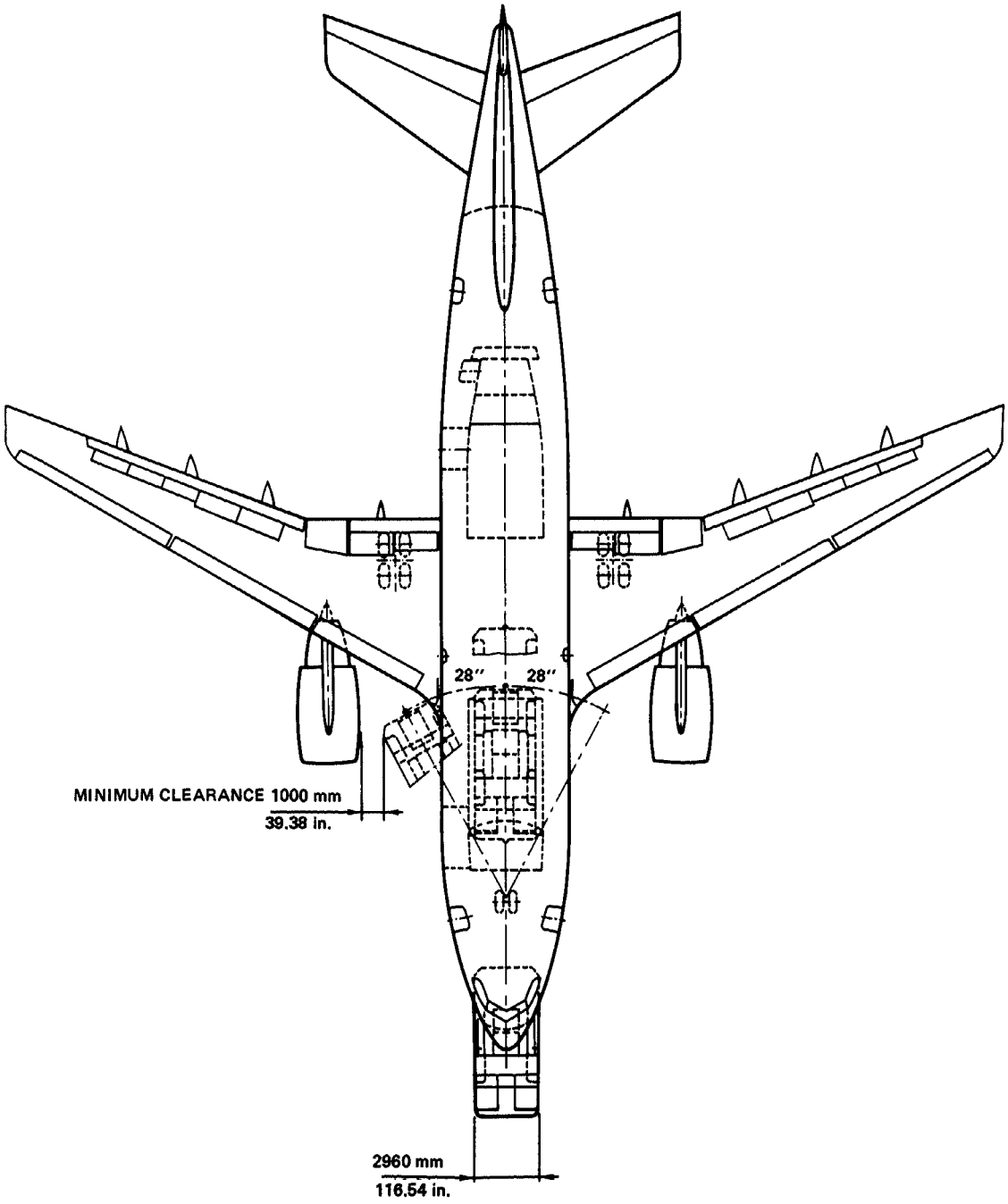
Towing Angles
Figure 010



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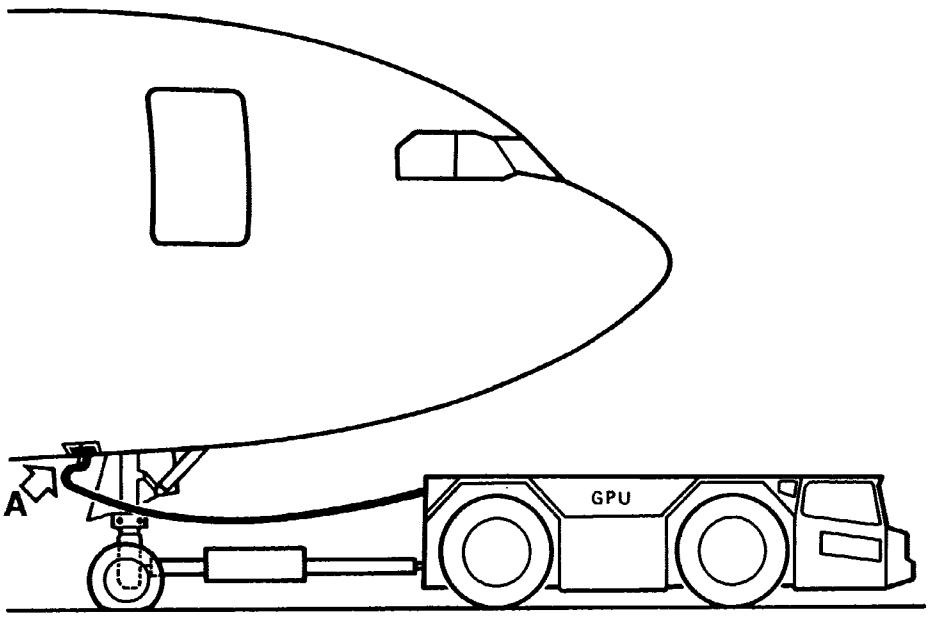
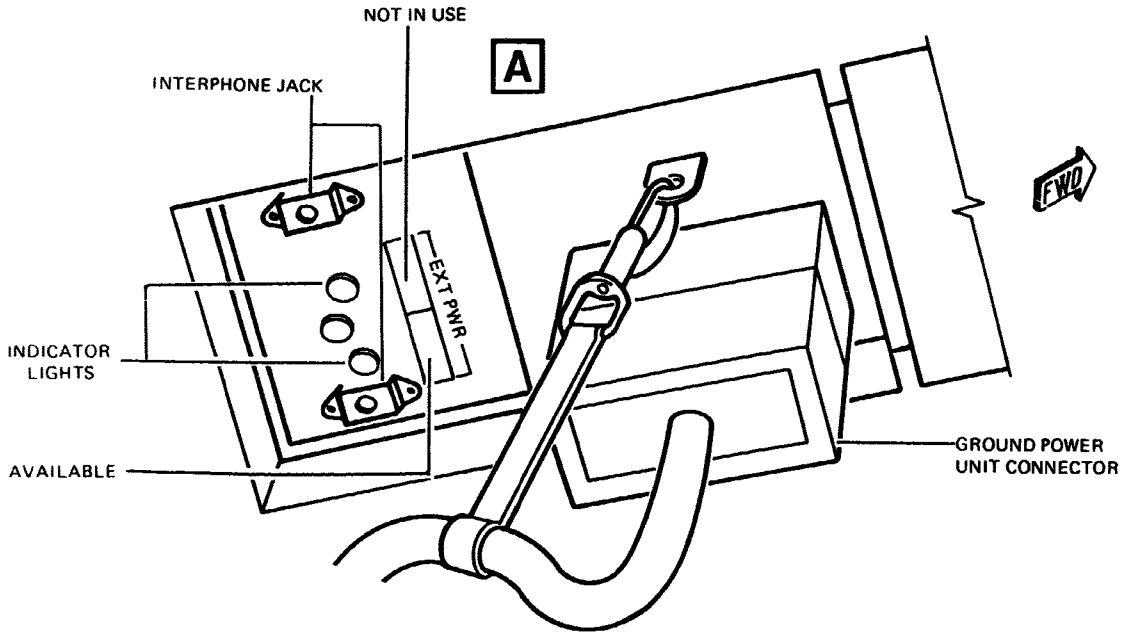
Aircraft Rearward Pulling - Tractor Under Fuselage
Aft of Nose Gear
Figure 011





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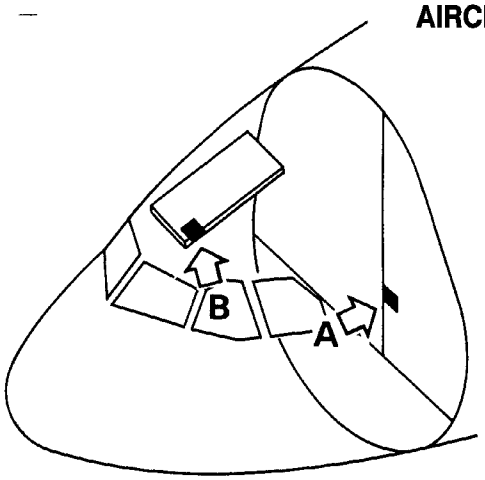
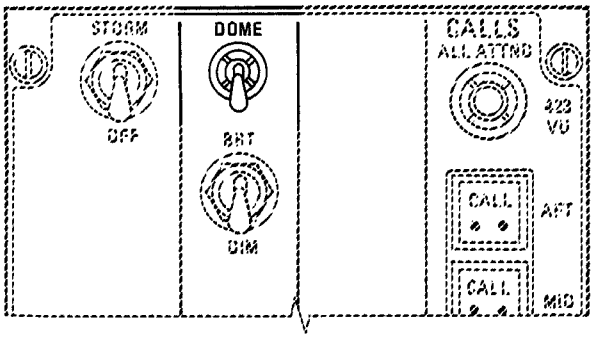
Electrical Supply
Figure 012





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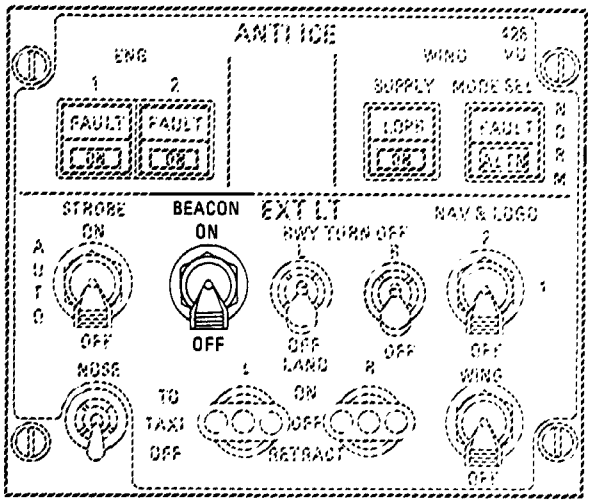

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Lighting Control Panel
Figure 013

green zone.
The 3000 psi (206 bars) pressure permits seven brake applications.
- If necessary, pressurize the yellow hydraulic system (Ref. 29-23-00, P. Block 301).
- Pressurize yellow hydraulic system during towing operations (Ref. 29-23-00, P. Block 301).

NOTE : If you energized the aircraft electrical network with the engine, do not pressurize the yellow hydraulic system.

(Ref. Fig. 014)

(9)Communication systems

(a)VHF system (Ref. Fig. 015)
If communication between the aircraft and the control tower is necessary, the VHF communication system No.1 must be activated.
(Ref. Fig. 016)

(b)Flight interphone system (Ref. Fig. 017)
During the towing operation, the flight interphone system must be used providing communication between the flight compartment and the ground crew.
The ground crew boomset connection is located in the electric ground power receptacle aft of the nose landing gear well.

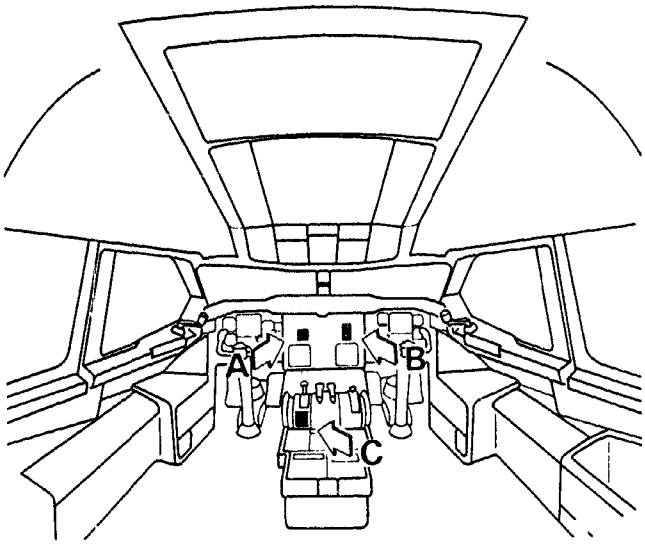
D. Towing Operation
Normal towing operation should only be carried out on suitable ground surfaces.
The conventional towbar is equipped with one calibrated shear pin and two calibrated turn shear pins for gear protection against excessive loads.
NOTE : We recommend that you use a towbar that has a damping system.
NOTE : For the requirements related to towbars and towbar tractors, refer to SIL 09-003.
Shock absorber reaction tends to induce a rocking movement after the aircraft is stopped. Consequently, sufficient spare must be left around the aircraft for all nose gear towing maneuvers. Towing should be carried out slowly and smoothly.
Speed limits:
- Doors closed and locked or removed, for a tractor with a towbar, a maximum speed of 25 km/h (15.5 mph) is permitted.
- Passenger/crew doors fully open and locked and/or cargo doors open in vertical position, a maximum speed of 10 km/h (6.21 mph) is permitted.

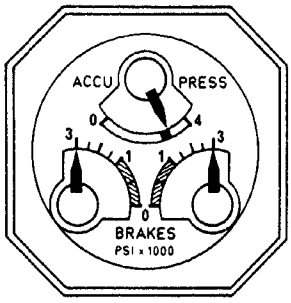
E. Towbar Disconnection (Ref. Fig. 018)
After "Pushback" (hydraulic pressure available), the towbar must be disconnected from the nose gear fittings before removing the tow lever safety pin.
In the case of nose wheel deflection, this is to avoid pressurization of the steering actuators so that the wheels align before the disconnection of the towbar.

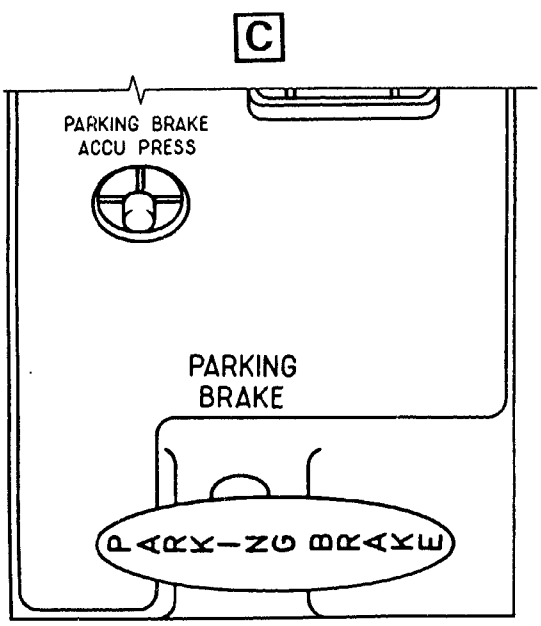
F. Close-up

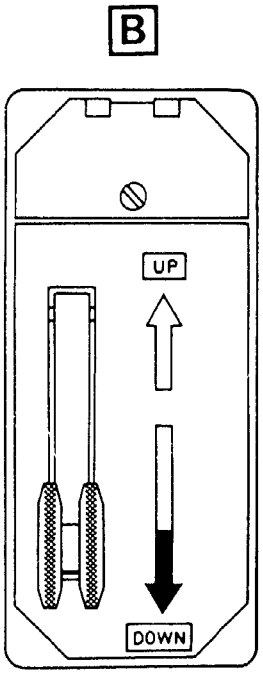
(1)De-energize the aircraft electrical network.

(a)If you energized with the tractor: (Ref. Fig. 012)
- de-energize the aircraft electrical network (Ref. 24-41-00,



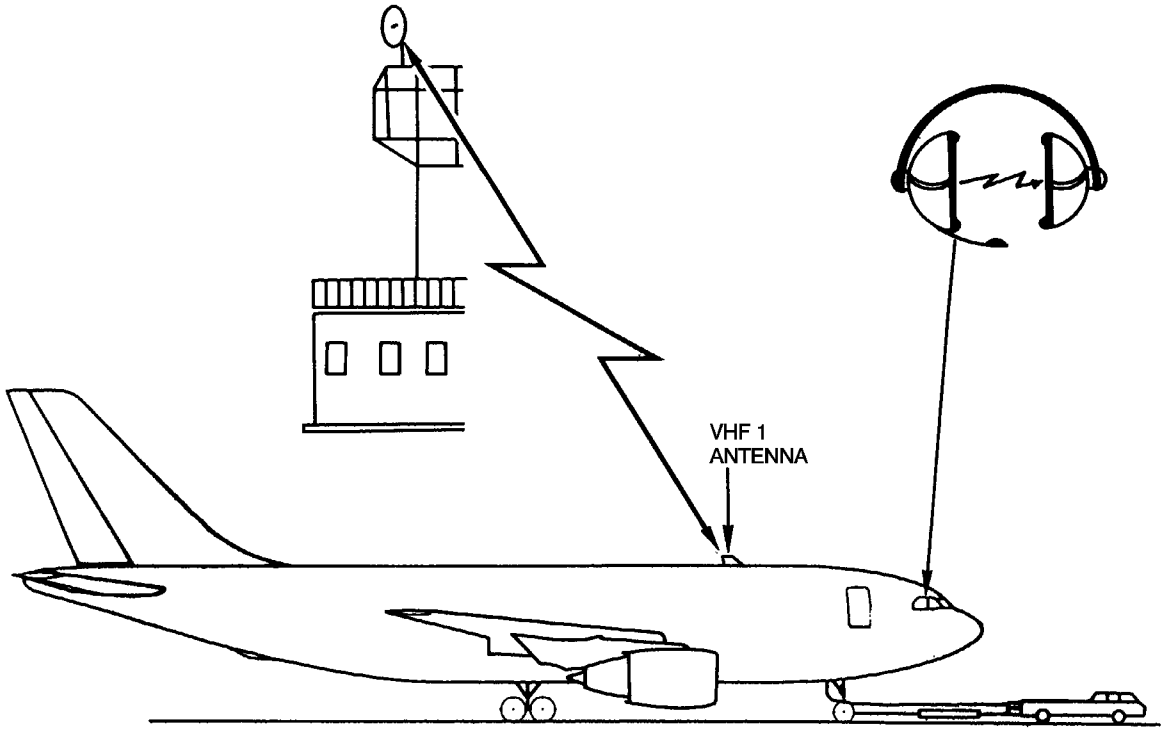






BM5 09 11 00 0 ALTO – 13

Landing Gear and Brake System
Figure 014



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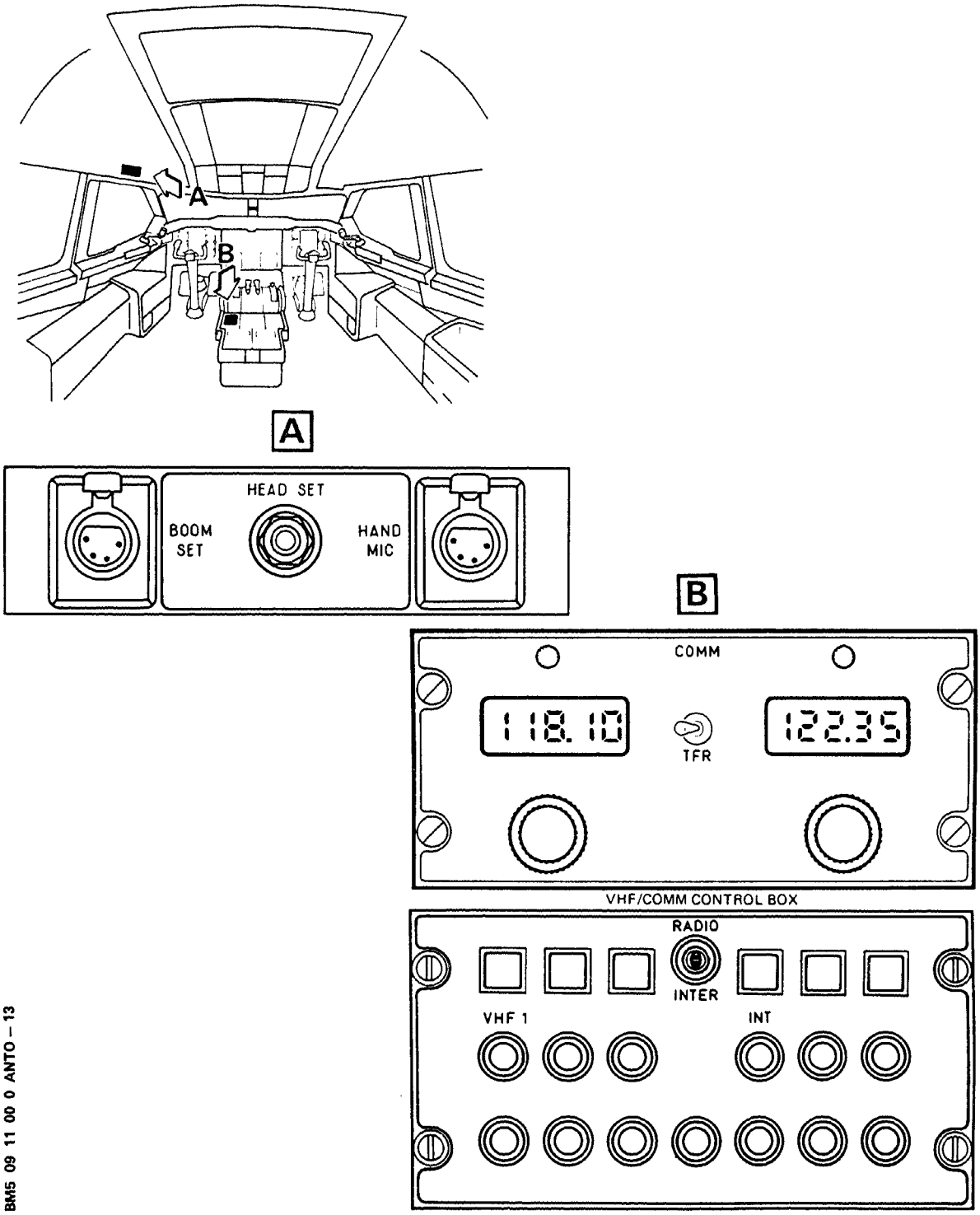
VHF System
Figure 015



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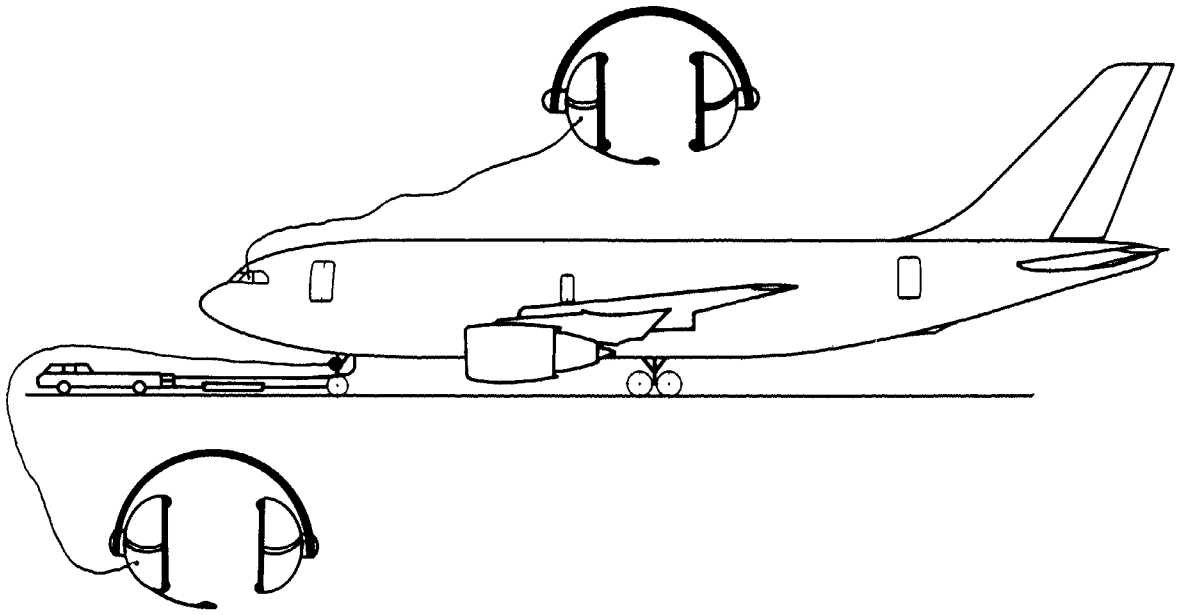
VHF System Controls
Figure 016



BM5 09 11 0 APM0 – 00

Flight Interphone System
Figure 017

P. Block 301)
- disconnect ground power unit provided on the tractor from ground power receptacle located underneath the fuselage aft of the nose gear well
- close access door 121EL.

(b)If you energized with the APU:
- de-energize the aircraft electrical network (Ref. 24-23-00, P. Block 301).

(c)If you energized with the engine:
- stop engine 2 (Ref. 80-00-00, P. Block 301).

(2)Position wheel chocks (Ref. Fig. 019).
(3)Apply parking brake.

2. Towing by the Nose Gear with Towbarless Tractor (Ref. Fig. 020)

WARNING : MAKE SURE THAT DURING THE TOWING OPERATION, NO PERSONS GO WHERE THE AIRCRAFT CAN CAUSE THEM INJURY.

CAUTION : WHEN YOU USE A TOWBARLESS TRACTOR, MAKE SURE THAT YOU OBEY FULLY ALL THE INSTRUCTIONS IN THIS PROCEDURE. IF YOU DO NOT, THE TRACTOR CAN CAUSE IMPORTANT SCRAPING OR OTHER DAMAGE TO THE NLG AND TO THE AIRFRAME STRUCTURE AROUND THE NLG.

R This procedure is for towing of the aircraft in maintenance configuration or
R to disengage the aircraft from the gate area (a push-back and then a forward
R tow without turns or multiple stops/starts).
R NOTE : Operational towing, i.e. towing an aircraft, loaded with
R passengers, fuel, and cargo, from the terminal gate or parking area,
R to a remote location is not permitted.

A. General

When this towing procedure is applied, the aircraft is towed by the nose gear, without a towbar.
The nose gear is jacked up and positioned at the appropriate location on the tractor. It is held in place by means of a nose gear wheel locking system.

NOTE : This procedure is for towing of the aircraft in maintenance configuration only and is not for operational towing.
Do not use a towbarless tractor to tow the aircraft to a dispatch area near the runway threshold.

(1)Equipment and Materials

ITEM	DESIGNATION
(1)	Wheel Chocks
(2)D22333000	Ground Safety Pin MLG
(3)C23157-0-1	Ground Safety Pin NLG
(4)	Special Tractor
(5)C22646	Safety Pin
Referenced Procedures	
- 05-51-22, P. Block 1	Inspection after NLG Towing Overload or Overrun
- 05-57-00, P. Block 1	Aircraft Stability
- 24-23-00, P. Block 301	Auxiliary AC Generation
- 24-41-00, P. Block 301	AC External Power Control

ITEM	DESIGNATION
- 29-23-00, P. Block 301	Yellow Auxiliary Power (Power Tranfer Unit)
- 32-00-00, P. Block 301	Landing Gear - GENERAL
- 80-00-00, P. Block 301	Starting - General

(2)Qualification of the tractor

NOTE : Towbarless tractors are subject to specific qualification procedure. Before towing be sure that the tractor is qualified for towbarless towing for this A/C. For more information on the towbarless tractors, refer to the SIL 09-002.

CAUTION : THE LANDING GEAR BRACE STRUT LOCKING DEVICES MUST ALWAYS BE FITTED WHEN THE AIRCRAFT IS ON THE GROUND OR BEING TOWED. USE ONLY TOWING EQUIPMENT DESIGNED OR APPROVED BY THE AIRCRAFT MANUFACTURER.

B. Precautions

R WARNING : OBEY THESE SAFETY PRECAUTIONS DURING TOWING PUSHBACK OR MOVEMENT
R OF THE AIRCRAFT.
R MAKE SURE THAT THE PATH OF THE AIRCRAFT IS CLEAR.
R MAKE SURE THAT NO PERSONS SIT OR STAND ON THE TOW BAR AND THAT NO
R NON-QUALIFIED PERSONS USE THE TRACTOR AS TRANSPORT. THIS IS TO
R PREVENT THE RISK OF INJURY.

WARNING : BEFORE POSITIONING THE NOSE GEAR ON THE TRACTOR, THE NOSE WHEEL STEERING SYSTEM MUST BE DEACTIVATED BY USING SAFETY PIN C22646.

WARNING : BEFORE POSITIONING THE LOCKING DEVICES, MAKE CERTAIN THAT THE LANDING GEAR IS DOWNLOCKED (REF. 32-00-00, P. BLOCK 301).

WARNING : DURING TOWING/TAXIING OPERATIONS (LOW-SPEED OPERATIONS INCLUDED), EACH PERSON IN THE AIRCRAFT MUST BE IN A SEAT AND THE SEAT BELT MUST BE FASTENED.
IF THE SEAT BELT IS NOT FASTENED, THERE IS A RISK OF INJURY IF THE AIRCRAFT STOPS SUDDENLY.

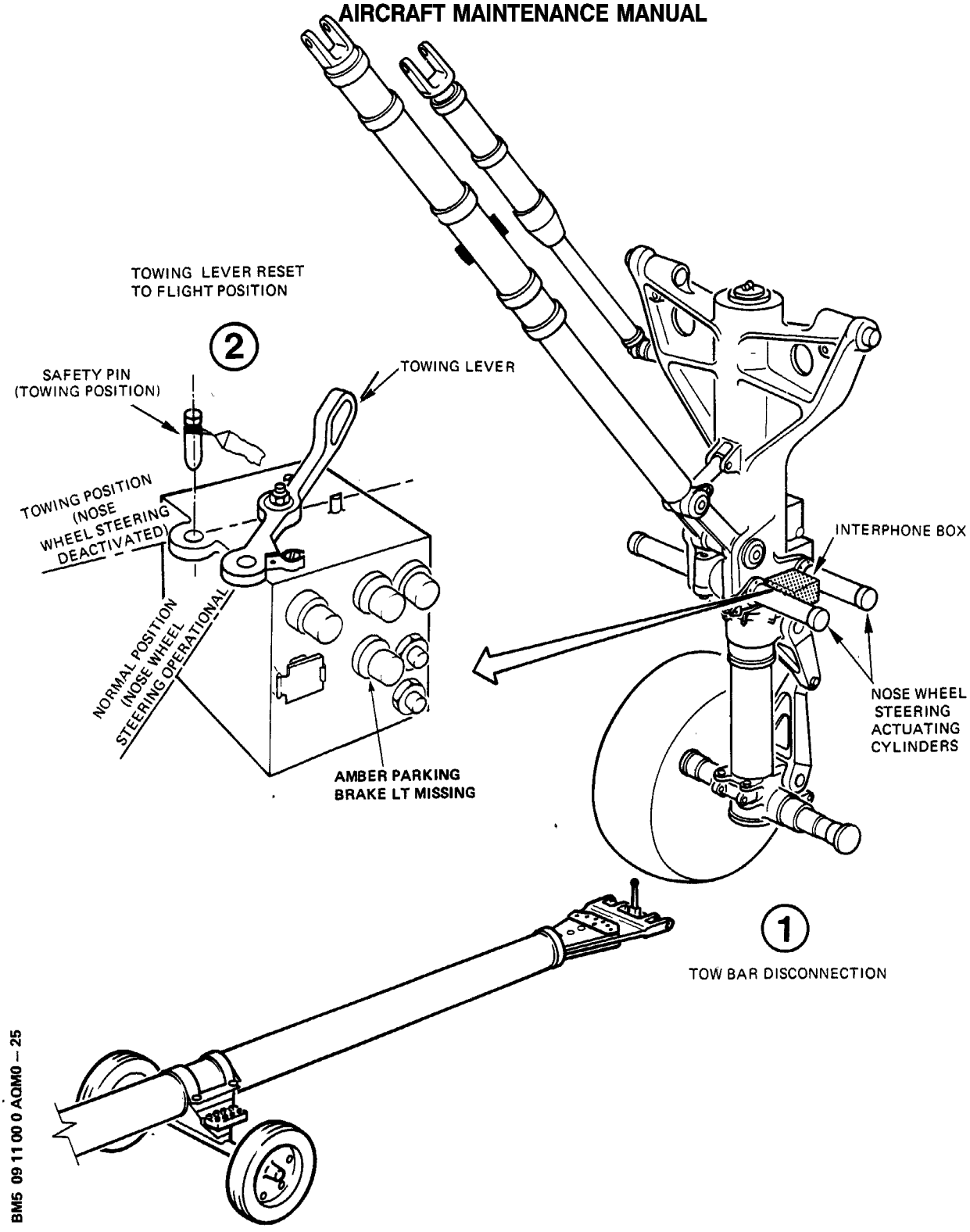
CAUTION : TOWING THE AIRCRAFT WITH ENGINE COWLINGS OPEN IS SPECIFICALLY FORBIDDEN DUE TO POSSIBILITY OF DAMAGE TO COWLS AND NACELLE STRUCTURE. ALL COWLS (FAN, REVERSER AND CORE) MUST BE CLOSED AND LATCHED, PRIOR TO TOWING.

C. Towing Preparation

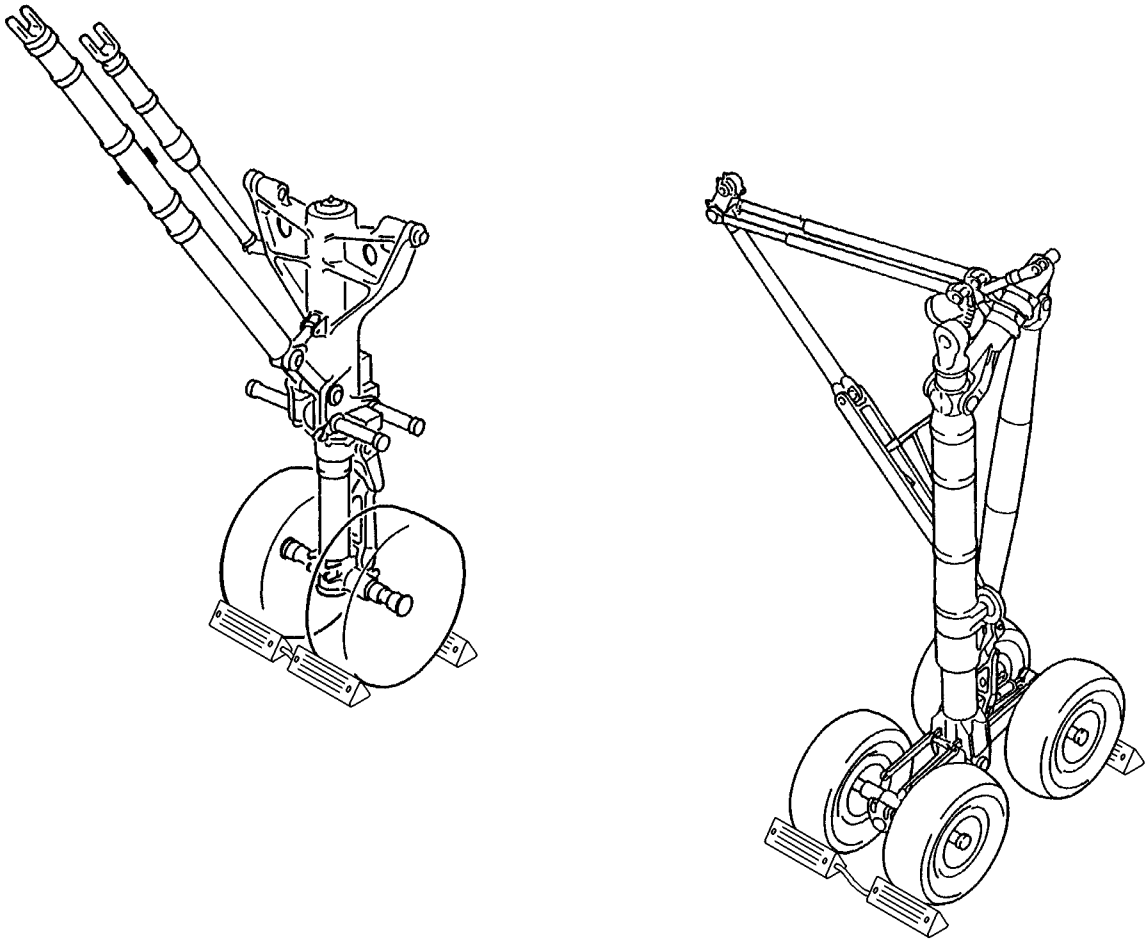
**ON A/C 105-200,

Post SB 32-2068 For A/C 105-200,

(1)Equipment and Materials



Tow Bar Disconnection
Figure 018



GENERAL DESCRIPTION OF WHEEL CHOCKS

WIDTH: THE WIDTH OF THE CHOCKS MUST BE SUFFICIENT FOR THE AIRCRAFT TIRES ON WHICH THE CHOCKS ARE INSTALLED (ONE WHEEL OR MORE ON ONE AXLE)

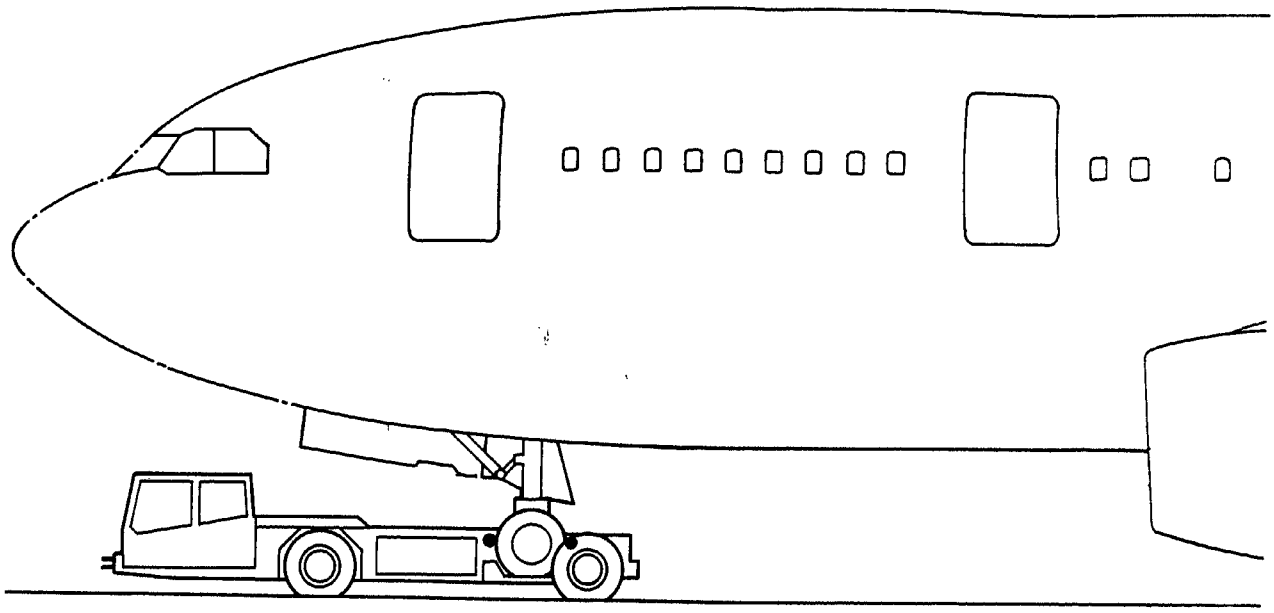
HEIGHT: THE SIZE OF THE CHOCKS MUST BE SUFFICIENT TO PREVENT MOVEMENT OF THE TIRE. THE CHOCK HEIGHT MUST AGREE WITH THE TIRE SIZE.

WEIGHT: THE WEIGHT OF THE CHOCKS MUST BE SUFFICIENT TO PREVENT THEIR MOVEMENT. STRONG WINDS OR JET BLAST MUST NOT BLOW THEM AWAY.

NOTE: FOR MORE INFORMATION ON THE WHEEL CHOCK DESIGN, REFER TO SAE AIR4905.

BM5 09 11 00 0 GAM0 00

Typical Installation of Wheel Chocks
Figure 019



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Towing by the Nose Gear
Figure 020

ITEM	DESIGNATION
(1)	Wheel Chocks
(2)D22333000	Ground Safety Pin MLG
(3)C23157 100-1	Ground Safety Pin NLG
(4)	Special Tractor
(5)C22646	Safety Pin
Referenced Procedures	
- 05-51-22, P. Block 1	Inspection after NLG Towing Overload or Overrun
- 05-57-00, P. Block 1	Aircraft Stability
- 24-23-00, P. Block 301	Auxiliary AC Generation
- 24-41-00, P. Block 301	AC External Power Control
- 29-23-00, P. Block 301	Yellow Auxiliary Power (Power Transfer Unit)
- 32-00-00, P. Block 301	Landing Gear - General
- 80-00-00, P. Block 301	Starting - General

(2)Qualification of the tractor

NOTE : Towbarless tractors are subject to specific qualification procedure. Before towing be sure that the tractor is qualified for towbarless towing for this A/C. For more information on the towbarless tractors, refer to the SIL 09-002.

CAUTION : THE LANDING GEAR BRACE STRUT LOCKING DEVICES MUST ALWAYS BE FITTED WHEN THE AIRCRAFT IS ON THE GROUND OR BEING TOWED. USE ONLY TOWING EQUIPMENT DESIGNED OR APPROVED BY THE AIRCRAFT MANUFACTURER.

B. Precautions

R WARNING : OBEY THESE SAFETY PRECAUTIONS DURING TOWING PUSHBACK OR MOVEMENT
R OF THE AIRCRAFT.
R MAKE SURE THAT THE PATH OF THE AIRCRAFT IS CLEAR.
R MAKE SURE THAT NO PERSONS SIT OR STAND ON THE TOW BAR AND THAT NO
R NON-QUALIFIED PERSONS USE THE TRACTOR AS TRANSPORT. THIS IS TO
R PREVENT THE RISK OF INJURY.

WARNING : BEFORE POSITIONING THE NOSE GEAR ON THE TRACTOR, THE NOSE WHEEL STEERING SYSTEM MUST BE DEACTIVATED BY USING SAFETY PIN C22646.

WARNING : BEFORE POSITIONING THE LOCKING DEVICES, MAKE CERTAIN THAT THE LANDING GEAR IS DOWNLOCKED (REF. 32-00-00, P. BLOCK 301).

WARNING : DURING TOWING/TAXIING OPERATIONS (LOW-SPEED OPERATIONS INCLUDED), EACH PERSON IN THE AIRCRAFT MUST BE IN A SEAT AND THE SEAT BELT MUST BE FASTENED.
IF THE SEAT BELT IS NOT FASTENED, THERE IS A RISK OF INJURY IF THE AIRCRAFT STOPS SUDDENLY.

CAUTION : TOWING THE AIRCRAFT WITH ENGINE COWLINGS OPEN IS SPECIFICALLY FORBIDDEN DUE TO POSSIBILITY OF DAMAGE TO COWLS AND NACELLE STRUCTURE. ALL COWLS (FAN, REVERSER AND CORE) MUST BE CLOSED AND LATCHED, PRIOR TO TOWING.

C. Towing Preparation

**ON A/C ALL

(1)Landing gear safety pins (Ref. Fig. 003, 021, 006)

**ON A/C 105-200,

Post SB 32-2068 For A/C 105-200,

(1)Landing gear safety pins (Ref. Fig. 004, 021, 006)

**ON A/C ALL

WARNING : BEFORE INSTALLING THE GROUND SAFETY PINS MAKE CERTAIN THAT THE LANDING GEAR IS DOWNLOCKED.
- IN FLIGHT COMPARTMENT, ON PANELS 400VU and 76VU, LH, NOSE, RH GREEN ARROWS ARE ON.
- DOWNLOCK VISUAL INDICATORS ARE VISIBLE ON WINGS (MAIN GEAR) AND ON TELESCOPIC DRAG STRUT (NOSE GEAR).

The landing gear must be mechanically secured in downlocked position during towing operation by inserting ground safety pins.

WARNING : WHENEVER THE GROUND SAFETY PIN IS INSTALLED ON THE NOSE GEAR TELESCOPIC STRUT ALWAYS VISUALLY CHECK THAT :
- IT HAS COMPLETELY AND EASILY ROTATED THE FORK-TYPE LEVER OF THE GROUND LOCKING SYSTEM.
- ITS STOP FLANGE ABUTS AGAINST THE HOUSING OF THE TELESCOPIC STRUT LOCKING SYSTEM (FULL INSERTION).

WARNING : WHEN THE GROUND SAFETY PIN IS REMOVED, VISUALLY CHECK THE DOWN POSITION OF THE FORK-TYPE LEVER ON THE TELESCOPIC STRUT GROUND LOCKING SYSTEM.

NOTE : It is optional to install the landing gear safety devices when you tow or push the aircraft during flight operations. (To put the aircraft in position for the flight crew at arrival or departure).

(2)Make sure that the aircraft is stable (Ref. 05-57-00, P. Block 1).

(3)Ground crew interphone box (Ref. Fig. 022)
For towing purposes the nose wheel steering system must be deactivated. This is carried out by a two position towing lever which must be set in the towing position and locked by a safety pin.

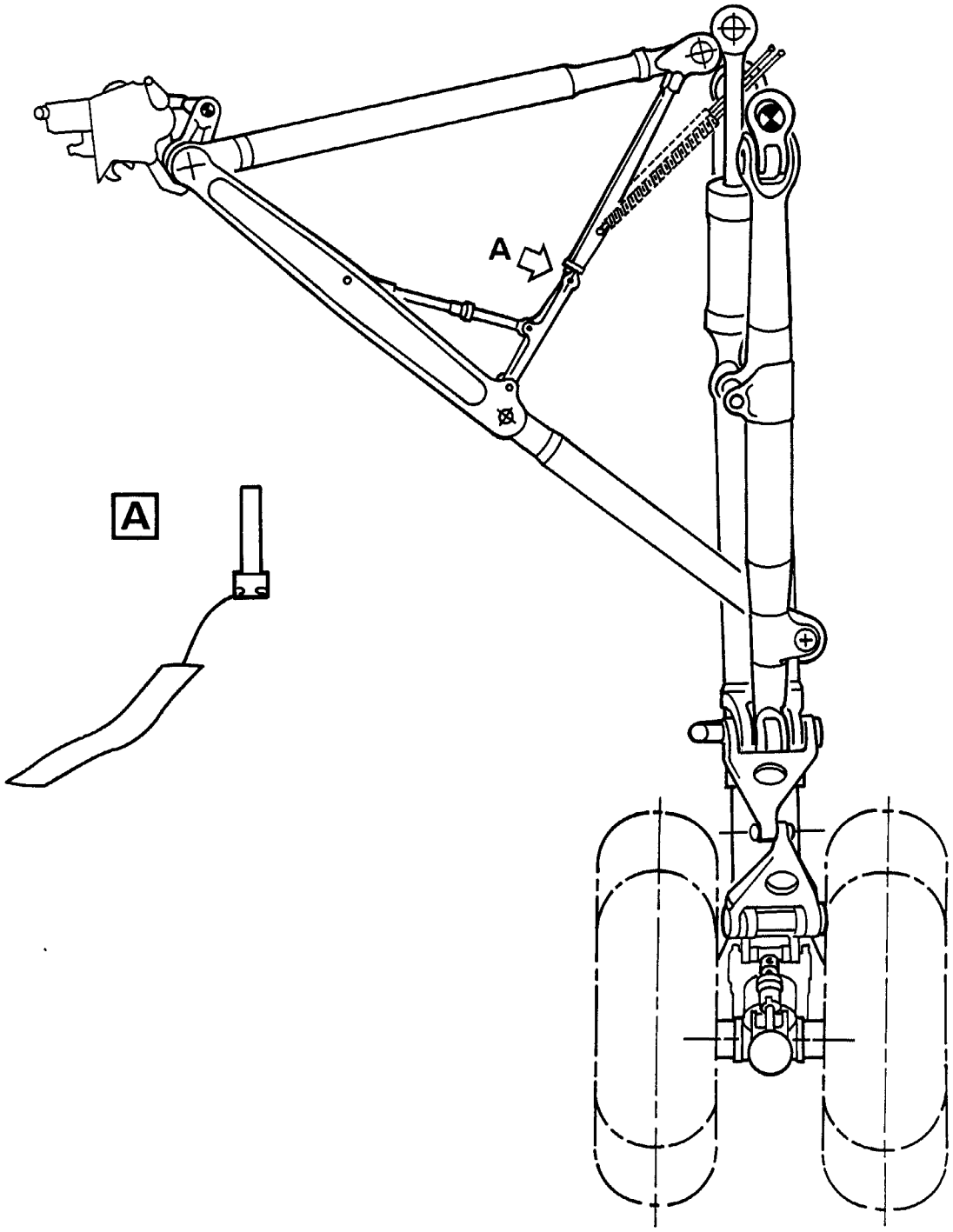
(4)Towing angles
The maximum angle allowed on each side of the aircraft center line is 95° whatever towing arrangement is used (Ref. Fig. 023).

**ON A/C 004-200,

WARNING : IF THE AIRCRAFT WEIGHT EXCEEDS 158T, STEERING ANGLE IS LIMITED TO 65°.

**ON A/C ALL

(5)Towing loads



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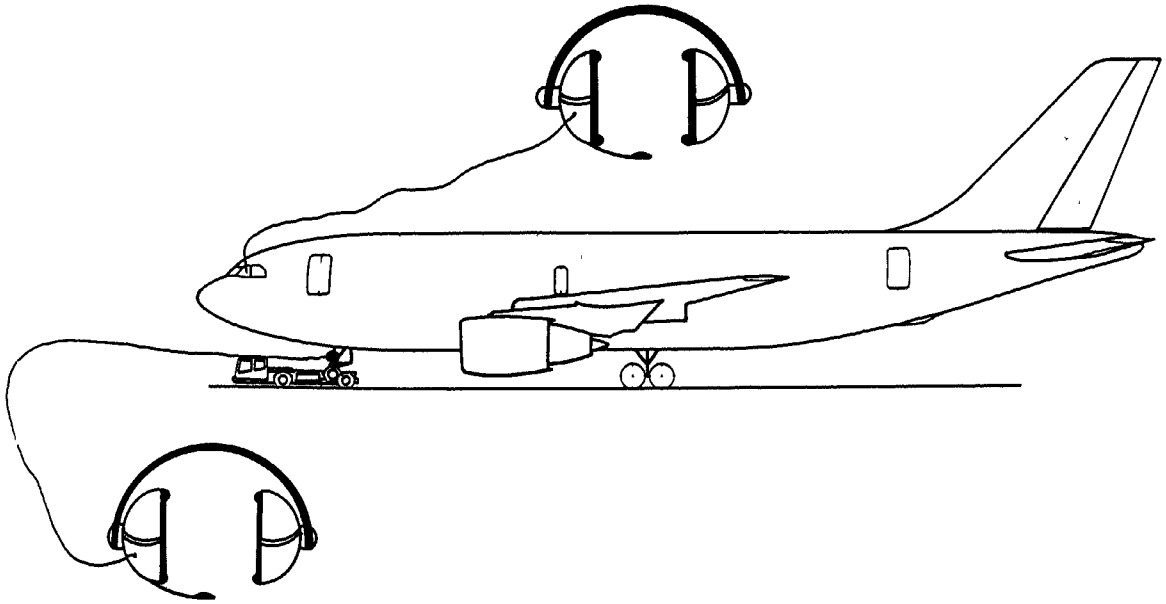
Main Landing Gear Safety Pins
Figure 021



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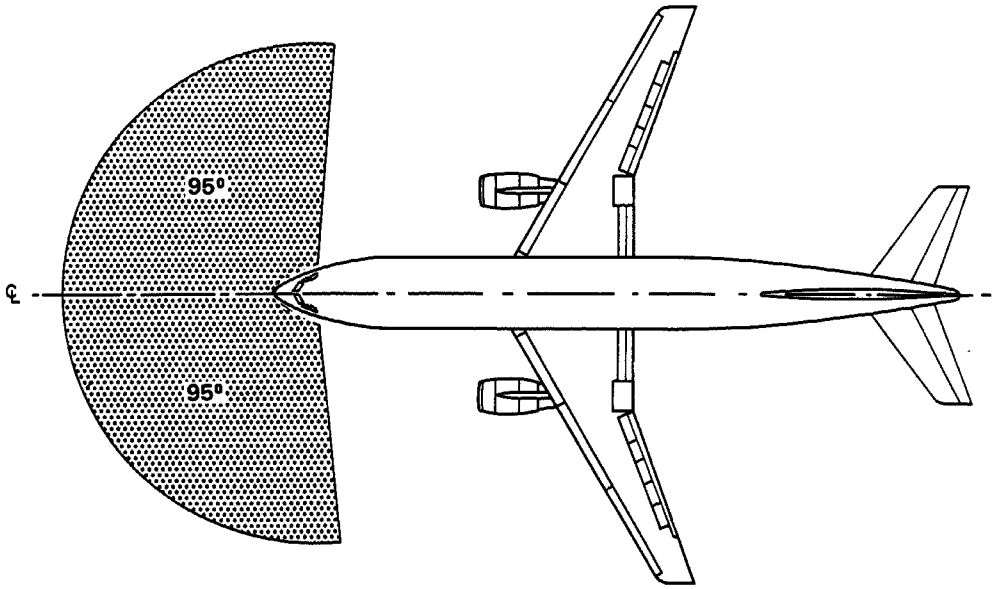
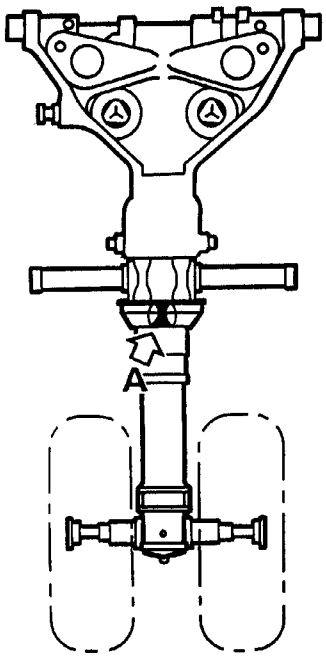
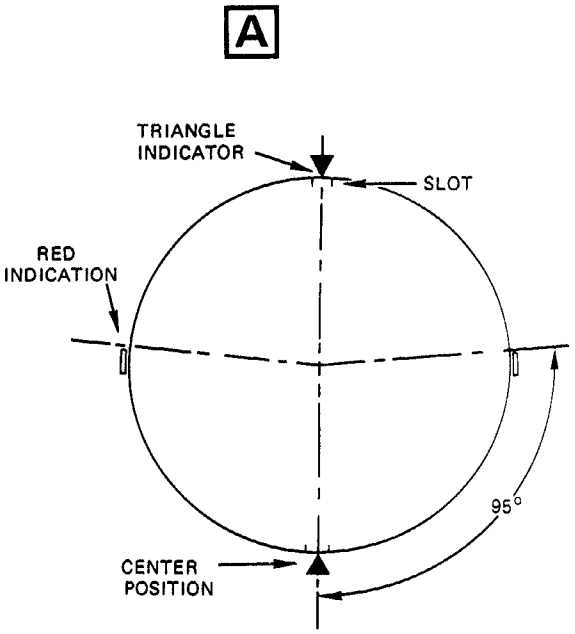
Flight Interphone System
Figure 022







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Towing Angles
Figure 023

- Four fixed indicators are located on the nose landing gear. The center position is indicated by a forward and a rear slot.

(a)Towing load applied to nose gear must not exceed 16,555 daN. (37217.11 lb.ft).
(b)Torque applied to nose gear must not exceed 1750 m.daN (12900 lbf.ft.).

(6)Energize the aircraft electrical network
During towing operations several aircraft systems have to be electrically supplied.
Before supplying the aircraft electrical network, the cockpit safety check must be performed.
(a)With the tractor (if the tractor is equipped with a GPU) (Ref. Fig. 024)
- open access door 121EL
- connect a ground power unit provided on the tractor to a ground power receptacle located underneath the fuselage aft of the nose gear well
- energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

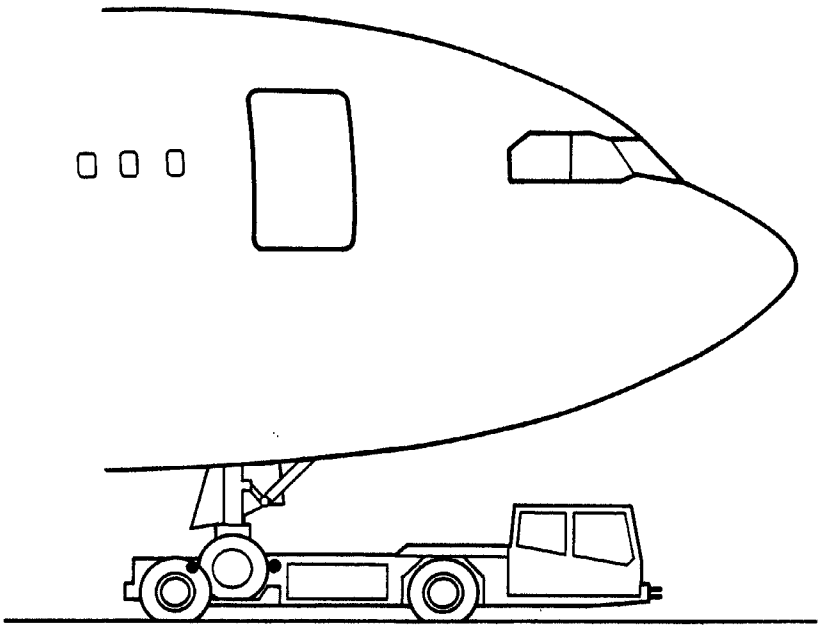
(b)Or with the APU
- energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

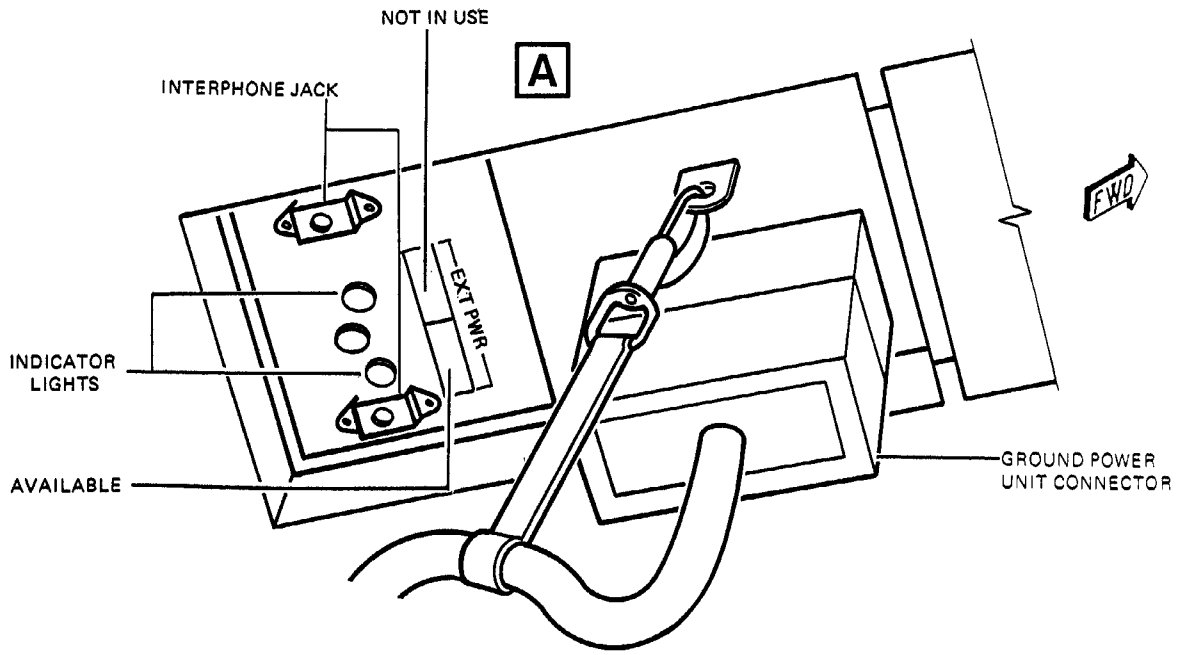
(c)Or with the engine
- start engine 2 (Ref. 80-00-00, P. Block 301).

(7)Lighting system
If necessary, the cockpit DOME lights must be switched ON.
At night, if the anti-collision lighting is required by local airport regulations or by airline procedures the BEACON/STROBE lighting must be turned ON.

(8)Landing gear and brake system (Ref. Fig. 025)
WARNING : WHEN YOU TOW THE AIRCRAFT WITH A TOWBARLESS TRACTOR,
THE PARKING BRAKE OR THE BRAKE PEDALS SHALL ONLY BE USED IN CASE OF EMERGENCY.
IF YOU APPLY THE PARKING BRAKE OR THE BRAKE PEDALS, YOU CAN CAUSE:
- OVERLOAD TO THE NOSE LANDING GEAR
- DAMAGE TO THE TOWBARLESS TRACTOR
- INJURY TO MAINTENANCE PERSONNEL
IF THIS OCCURS, YOU MUST REFER TO AIRBUS.

- During towing maneuvers, one person shall be in the flight compartment in order to operate the brakes, if required.
- Before the breakaway, release the brakes and make sure that on the panel 4VU, the pressure indication on the yellow brake pressure triple indicator is correct (3000 psi (206 bars)). The pointer must be in the green zone.
The 3000 psi (206 bars) pressure permits seven brake applications.
- If necessary, pressurize the yellow hydraulic system (Ref. 29-23-00, P. Block 301).
- Pressurize the yellow hydraulic system during towing operations (Ref. 29-23-00, P. Block 301).





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Electrical Supply
Figure 024

NOTE : If you energized the aircraft electrical network with the engine, do not pressurize the yellow hydraulic system.

(9)Communication systems

(a)VHF system (Ref. Fig. 026)

If communication between the aircraft and the control tower is necessary, the VHF communication system No. 1 must be activated. (Ref. Fig. 027)

(b)Flight interphone system (Ref. Fig. 022)

During the towing operation, the flight interphone system must be used providing communication between the flight compartment and the ground crew.

The ground crew boomset connection is located in the electric ground power receptacle aft of the nose landing gear well.

D. Towing Operation

(1)Select the A/C type on the towbarless tractor if necessary.

(2)Load NLG on the towbarless tractor.

CAUTION : WHEN YOU PUT THE NOSE LANDING GEAR ON THE TRACTOR, BE CAREFUL TO ALIGN THE CLAMPING DEVICE OF THE TRACTOR WITH THE NLG AXIS. THE GAP BETWEEN THE CRADLE AND THE TORQUE LINK IS VERY SMALL. THUS, IF YOU DO NOT ALIGN THE CLAMPING DEVICE WITH THE NLG AXIS, THERE IS A RISK OF DAMAGE TO THE TORQUE LINK PIN.

WARNING : MAKE SURE THAT NLG CANNOT BE DISENGAGED FROM THE TRACTOR.

(3)Towing

Normal towing operation should only be carried out on suitable ground surfaces.

Shock absorber reaction tends to induce a rocking movement after the aircraft is stopped. Consequently sufficient spare must be left around the aircraft for all nose gear towing maneuvers. Towing should be carried out slowly and smoothly.

Speed limits :

- Doors closed and locked or removed, for a tractor without a tow bar, a maximum speed of 32 km/h (19.8 mph) is permitted.
- Passenger/crew doors fully open and locked and/or cargo doors open in vertical position, a maximum speed of 10 km/h (6.21 mph) is permitted.

On interphone box 3WC, position towing control lever in "towing" position and lock lever by installing safety pin C22646 (Ref. Fig. 028).

E. Close-Up

NOTE : It is advisable to stop with the nose wheels in the aircraft centerline.

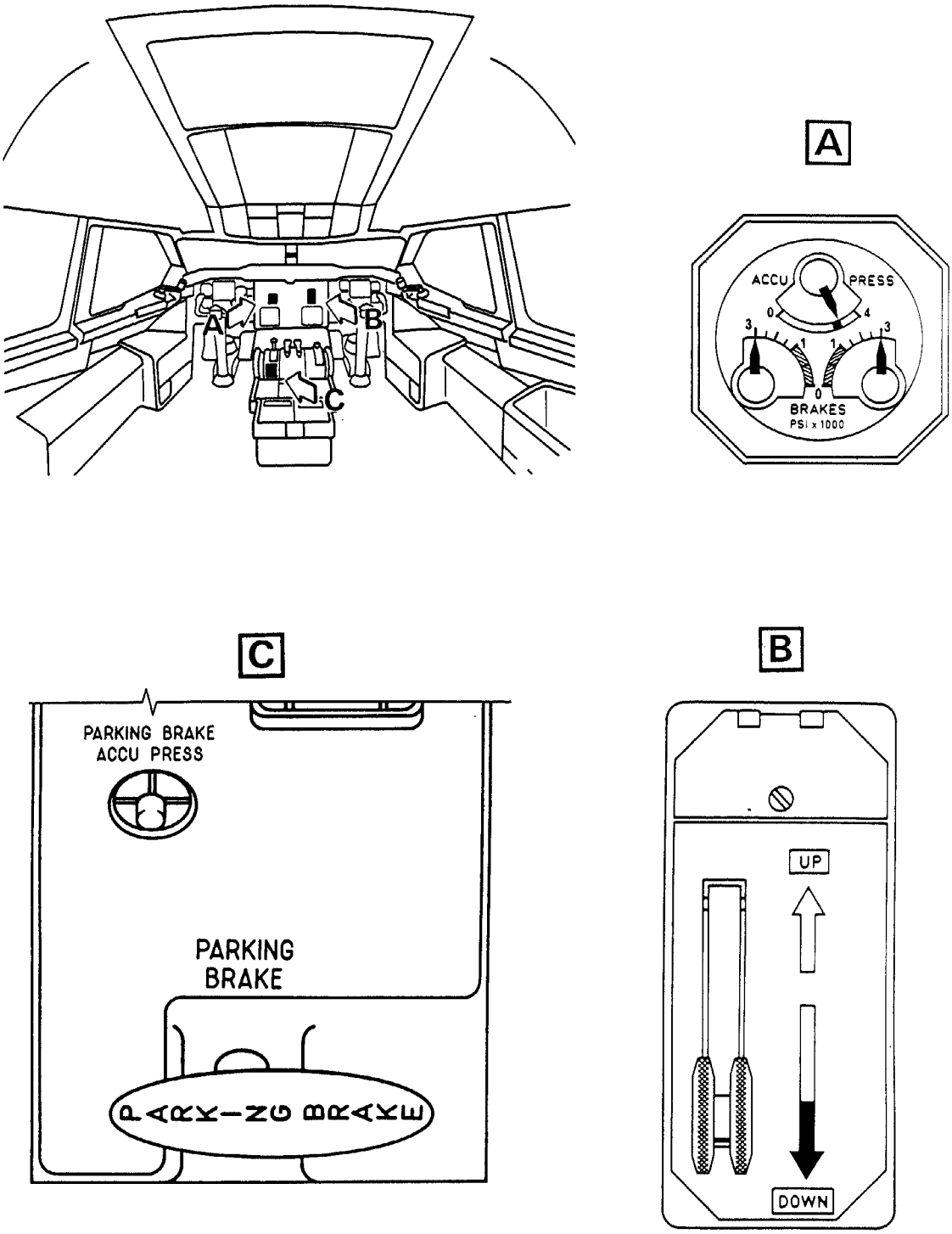
(1)De-energize the aircraft electrical circuits

(a)If you energized with the tractor (Ref. Fig. 024)

- de-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301)
- disconnect ground power unit provided on the tractor from ground power receptacle located underneath the fuselage aft of the nose gear well
- close access door 121EL.

(b)If you energized with the APU

- de-energize the aircraft electrical network (Ref. 24-23-00,



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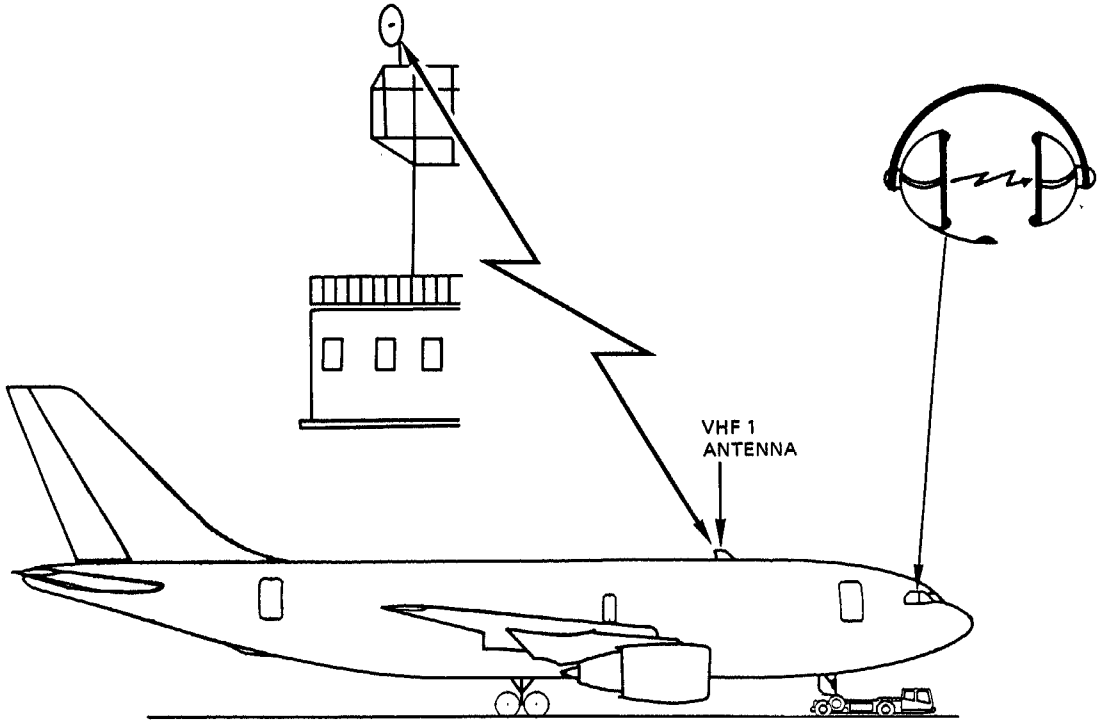
Landing Gear and Brake System
Figure 025



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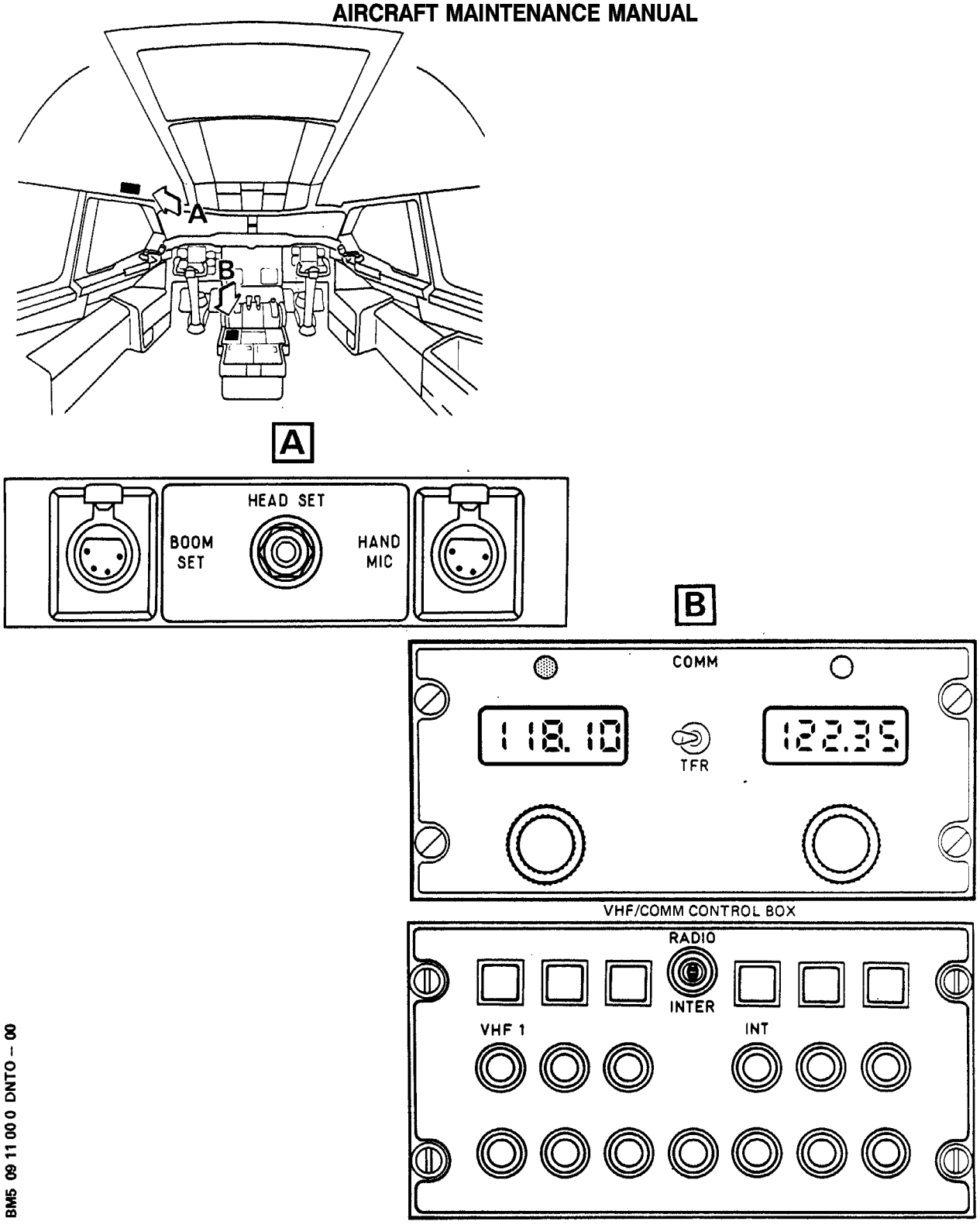
VHF System
Figure 026



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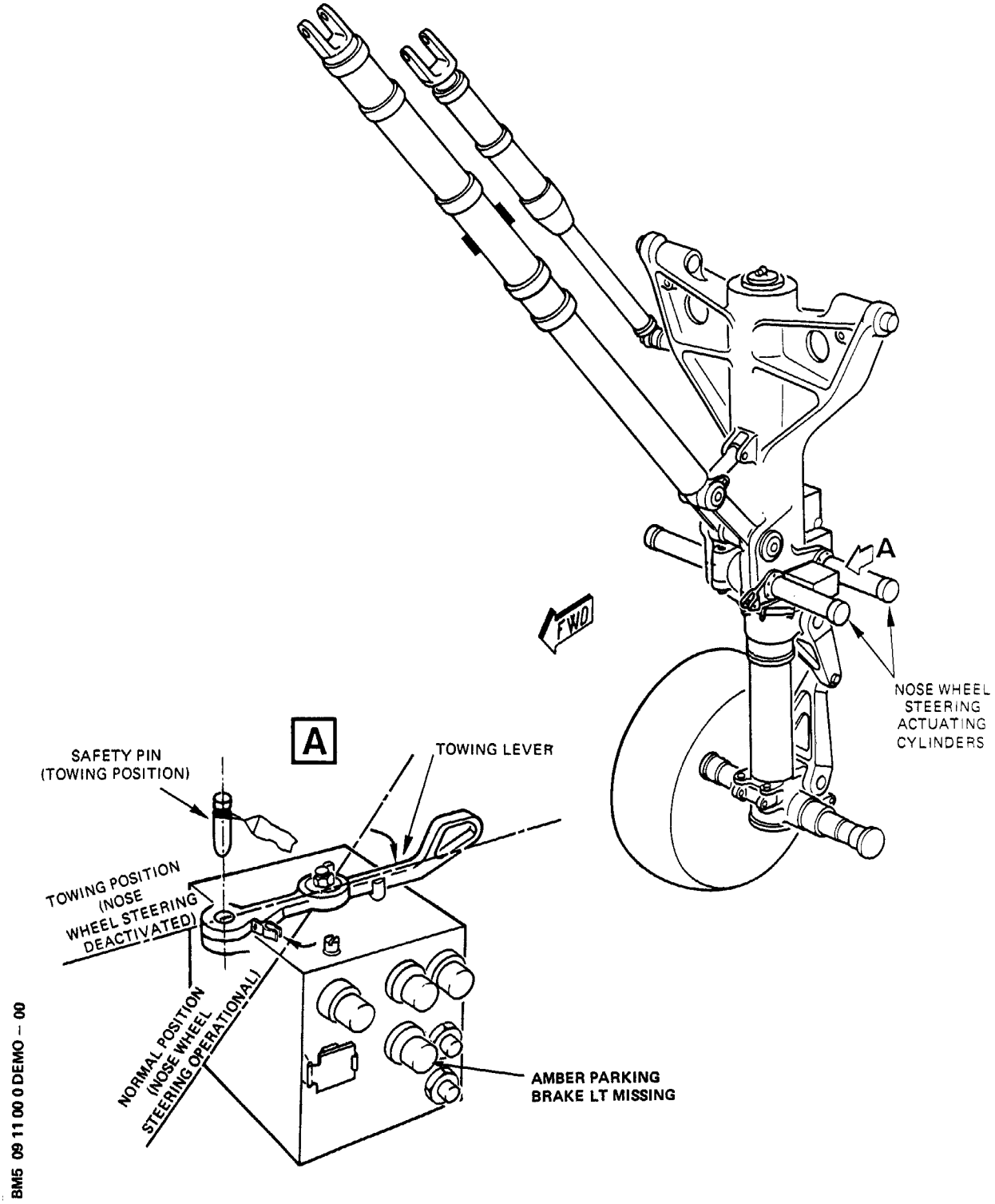
VHF System Controls
Figure 027



Interphone Box
Figure 028

P. Block 301).
(c)If you energized with the engine
- stop engine 2 (Ref. 80-00-00, P. Block 301).
(2)Position wheel chocks (Ref. Fig. 019).
(3)Apply parking brake.
(4)Unload the NLG from the towbarless tractor.
(5)Remove safety pin and ensure that control lever is in "normal" position.

3. Towing by the Main Landing Gear

WARNING : MAKE SURE THAT WHEN THE AIRCRAFT MOVES WITH ITS POWER ON THE GROUND:
- NO PERSONS GO WHERE THE AIRCRAFT CAN CAUSE THEM INJURY OR CAN KILL THEM
- NO OBJECTS STAY WHERE THE ENGINES CAN BLOW THEM AWAY OR CAN PULL THEM INTO THE ENGINES BY SUCTION.

CAUTION : DO NOT TOW OR MOVE THE AIRCRAFT ON THE GROUND IF THE ENGINE COWLS ARE OPEN.
MOVEMENT OF THE AIRCRAFT WITH THE COWLS OPEN CAN CAUSE DAMAGE TO THE COWLS AND THE NACELLE STRUCTURE.

A. General
Two tow fittings are provided on each main landing gear.
The front fittings are used for forward pulling with the tractor placed in front of the aircraft.
The rear fittings serve for rearward pulling with the tractor placed behind of the aircraft.
(1)Equipment and Materials

ITEM	DESIGNATION
(1)C22646	Safety Pin
(2)C22783	Ground Safety Pin MLG
(3)C23157-0-1	Ground Safety Pin NLG
**ON A/C 105-200,	
Post SB 32-2068 For A/C 105-200,	
(3)C23157 100-1	Ground Safety Pin NLG
**ON A/C ALL	
(4)	Movable Taxiway Plates
(5)	Special Tractor
(6)98A09001001000	Bar-Steering-Nose Wheel
(7)98F09103500000	Cable,Towing-MLG
(8)D22800000	Towing Lifting and Debogging Fittings
Referenced Procedures	
- 05-57-00, P. Block 1	Aircraft Stability
- 24-23-00, P. Block 301	Auxiliary AC Generation

ITEM	DESIGNATION
- 24-41-00, P. Block 301	AC External Power Control
- 29-23-00, P. Block 301	Yellow Auxiliary Power (Power Transfer Unit)
- 32-00-00, P. Block 301	Landing Gear - General
- 80-00-00, P. Block 301	Starting - General

B. Precautions

R WARNING : OBEY THESE SAFETY PRECAUTIONS DURING TOWING PUSHBACK OR MOVEMENT
R OF THE AIRCRAFT.
R MAKE SURE THAT THE PATH OF THE AIRCRAFT IS CLEAR.
R MAKE SURE THAT NO PERSONS SIT OR STAND ON THE TOW BAR AND THAT NO
R NON-QUALIFIED PERSONS USE THE TRACTOR AS TRANSPORT. THIS IS TO
R PREVENT THE RISK OF INJURY.

WARNING : BEFORE POSITIONING THE LOCKING DEVICES, MAKE CERTAIN THAT THE LANDING GEAR IS DOWNLOCKED (REF. 32-00-00, P. BLOCK 301).

WARNING : DURING TOWING/TAXIING OPERATIONS (LOW-SPEED OPERATIONS INCLUDED), EACH PERSON IN THE AIRCRAFT MUST BE IN A SEAT AND THE SEAT BELT MUST BE FASTENED.
IF THE SEAT BELT IS NOT FASTENED, THERE IS A RISK OF INJURY IF THE AIRCRAFT STOPS SUDDENLY.

CAUTION : THE LANDING GEAR BRACE STRUT LOCKING DEVICES MUST ALWAYS BE FITTED WHEN THE AIRCRAFT IS ON THE GROUND OR BEING TOWED.
USE ONLY TOWING EQUIPMENT DESIGNED OR APPROVED BY THE AIRCRAFT MANUFACTURER.

CAUTION : TOWING THE AIRCRAFT WITH ENGINE COWLINGS OPEN IS SPECIFICALLY FORBIDDEN DUE TO POSSIBILITY OF DAMAGE TO COWLS AND NACELLE STRUCTURE. ALL COWLS (FAN, REVERSER AND CORE) MUST BE CLOSED AND LATCHED, PRIOR TO TOWING.

C. Towing Preparation

(1)Landing gear safety pins

(Ref. Fig. 003, 005)

**ON A/C 105-200,

Post SB 32-2068 For A/C 105-200,

(Ref. Fig. 004, 005)

**ON A/C ALL

The landing gear must be mechanically secured in the downlocked position during towing operation by inserting ground safety pins.

WARNING : WHENEVER THE GROUND SAFETY PIN IS INSTALLED ON THE NOSE GEAR TELESCOPIC STRUT, ALWAYS VISUALLY CHECK THAT:
- IT HAS COMPLETELY AND EASILY ROTATED THE FORK-TYPE LEVER OF THE GROUND LOCKING SYSTEM.
- ITS STOP FLANGE ABUTS AGAINST THE HOUSING OF THE TELESCOPIC

STRUT LOCKING SYSTEM (FULL INSERTION).

WARNING : WHEN THE GROUND SAFETY PIN IS REMOVED, VISUALLY CHECK THE DOWN POSITION OF THE FORK-TYPE LEVER ON THE TELESCOPIC STRUT GROUND LOCKING SYSTEM.

NOTE : It is optional to install the landing gear safety devices when you tow the aircraft during flight operations.

(2)Landing gear and brake system (Ref. Fig. 014)

- During debogging maneuvers, one person shall be in the flight compartment in order to operate the brakes, if required.
- Before the breakaway, release the brakes and make sure that on the panel 4VU, the pressure indication on the yellow brake pressure triple indicator is correct (3000 psi (206 bars)). The pointer must be in the green zone.

The 3000 psi (206 bars) pressure permits seven brake applications.

- If necessary, pressurize the yellow hydraulic system (Ref. 29-23-00, P. Block 301).
- Pressurize the yellow hydraulic system during towing operations (Ref. 29-23-00, P. Block 301).

NOTE : If you energized the aircraft electrical network with the engine, do not pressurize the yellow hydraulic system.

(3)Make sure that the aircraft is stable (Ref. 05-57-00, P. Block 1).

(4)Ground crew interphone box (Ref. Fig. 007).

For towing purposes, the nose wheel steering system must be deactivated. This is carried out by a two position towing lever which must be set in the towing position and locked by a safety pin.

(5)Put the tractor, aligned with the aircraft centerline, in front of the aircraft.

(6)If there is mud on the ground put, the movable taxiway plates in position in front of the wheels to make the ground hard.

(7)Install the towing cable.

(Ref. Fig. 029)

(a)Make sure that the CABLE, TOWING-MLG (98F09103500000) has a traction shear pin calibrated to 50 000 +0 -3000 daN (112404.5500 +0.0000 -6744.2670 lbf).

(b)Install the CABLE, TOWING-MLG (98F09103500000) in the forward fittings or the aft fittings of the main landing gear with the TOWING LIFTING and DEBOGGING FITTING (D22800000) and the tractor connector.

(c)Install the BAR-STEERING, NOSE WHEEL (98A09001001000) in the nose landing gear fitting to manually turn the nose wheels during the towing operation.

(8)Energize the aircraft electrical network.

During towing operations, several aircraft systems have to be electrically supplied.

Before supplying the aircraft electrical network, the Cockpit Safety check must be performed.

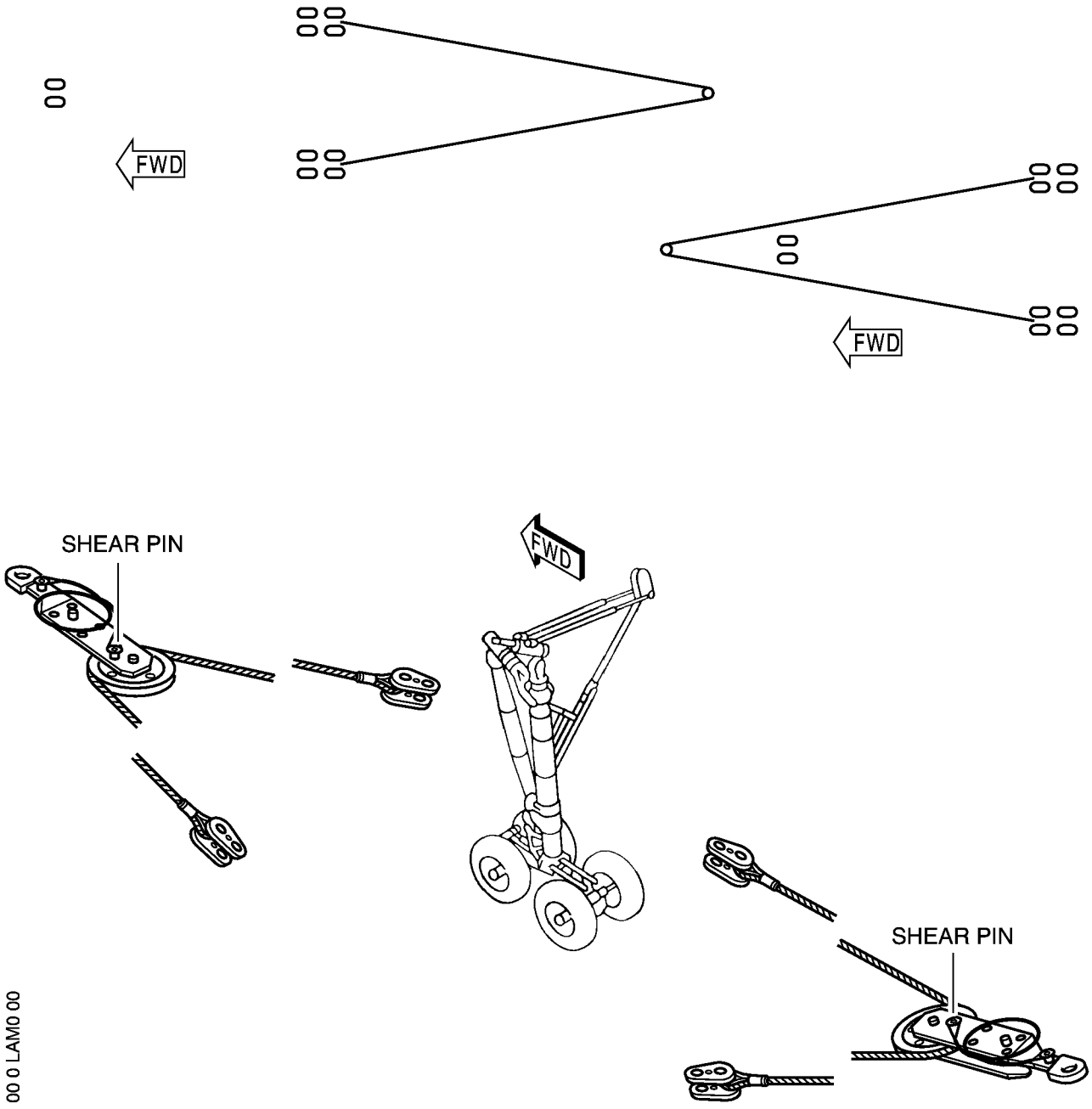
(a)Energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).

(b)Or with the APU:

- energize the aircraft electrical network (Ref. 24-23-00, P. Block 301).

(c)Or with the engine:

- start engine 2 (Ref. 80-00-00, P. Block 301).



Installation of Towing Cable
Figure 029

R

(9)Remove the wheel chocks from the main landing gear wheels and nose landing gear wheels.

(10)Lighting System

If necessary, the cockpit **DOME** lights must be switched **ON.**

At night, if the anti-collision lighting is required by local airport regulations or by airline procedures, the **BEACON/STROBE** lighting must be turned **ON.**

(11)Communication systems

(a)VHF system

If communication between the aircraft and the control tower is necessary, the VHF communication system No. 1 must be activated.
(Ref. Fig. 030)
(Ref. Fig. 016)

(b)Flight interphone system (Ref. Fig. 031)

During the towing operation, the flight interphone system must be used providing communication between the flight compartment and the ground crew.

The ground crew boomset connection is located in the electric ground power receptacle aft of the nose landing gear well.

C. Towing Operation

(1)Approximate Towing Loads
(Ref. Fig. 032, 033)

(a)Apply these coefficients for the friction between the tires and the ground:

Dry concrete or asphalt: 0.80
Wet asphalt: 0.75
Wet concrete: 0.57
Hard snow: 0.20
Ice: 0.05

(2)Towing
(Ref. Fig. 032, 033)

(a)The maximum steering angle in the horizontal plane is 30 degrees on each side of the aircraft centerline.

When the towing is along the aircraft centerline, the nose landing gear keeps the limits.

(b)The maximum angle in the vertical plane is 11 degrees which goes through the towing fitting of the main gear.

(c)During the towing operations, put:

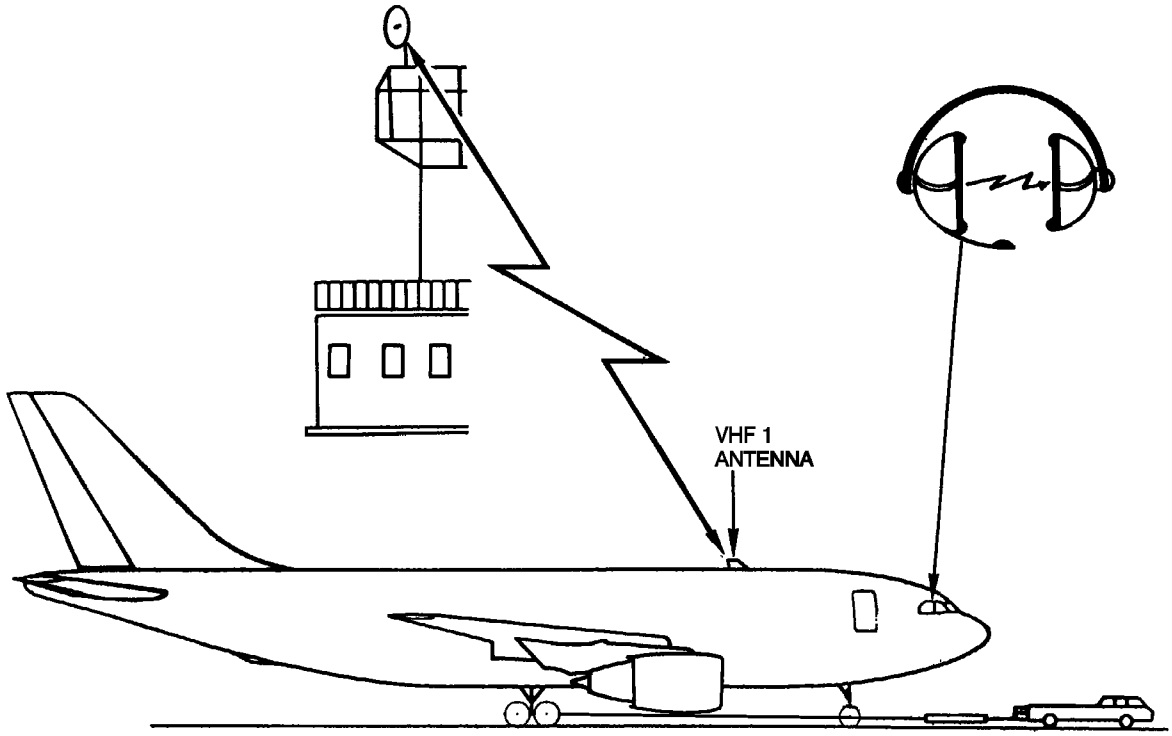
- one person in the cockpit to operate the brake pedals if necessary,
- two persons to monitor the wing tips.

(3)During the towing operations, on the panel 4VU, you must monitor the pressure on the triple pressure indicator on the top gage.

- If the pressure is approximately 2000 psi (137.8951 bar), pressurize the Blue hydraulic system agin (Ref. 29-23-00, P. Block 301).

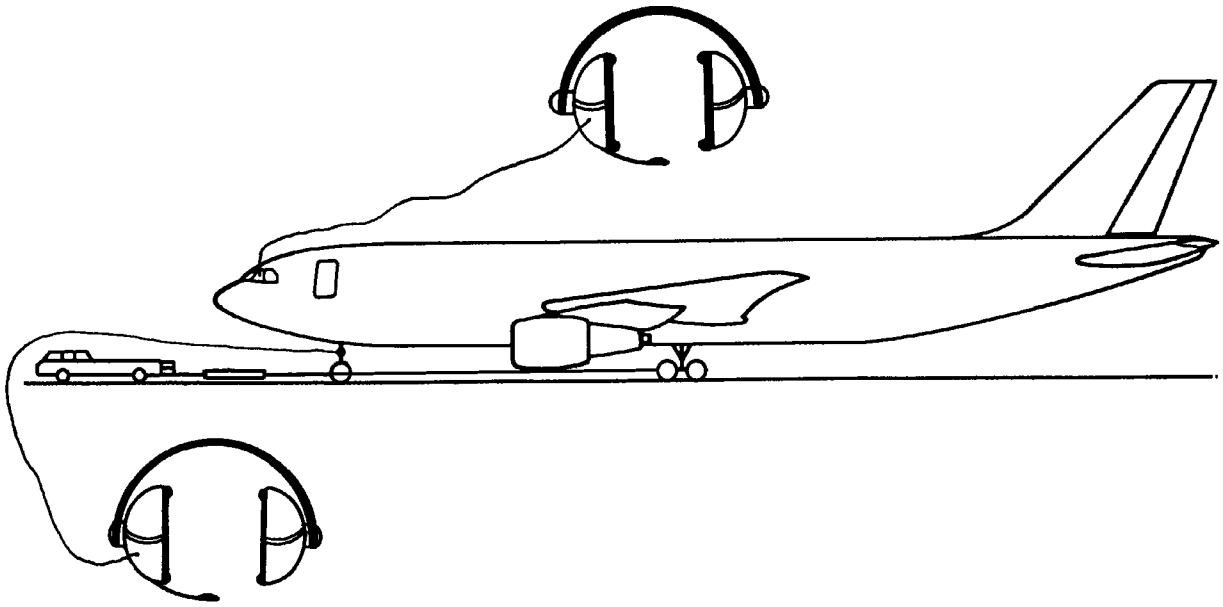
(4)Tow the aircraft smoothly if possible and keep the tractor aligned with the aircraft centerline. You can make turns only if the ground conditions are good.

4. Close-up



BM5 09 11 00 0 LFM0 00

VHF System
Figure 030



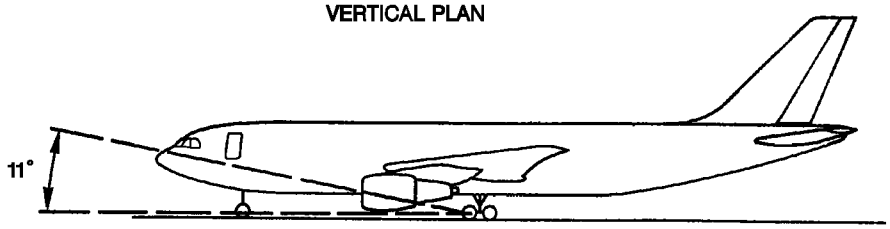
BM5 09 11 00 0 LCM0 00

Flight Interphone System
Figure 031

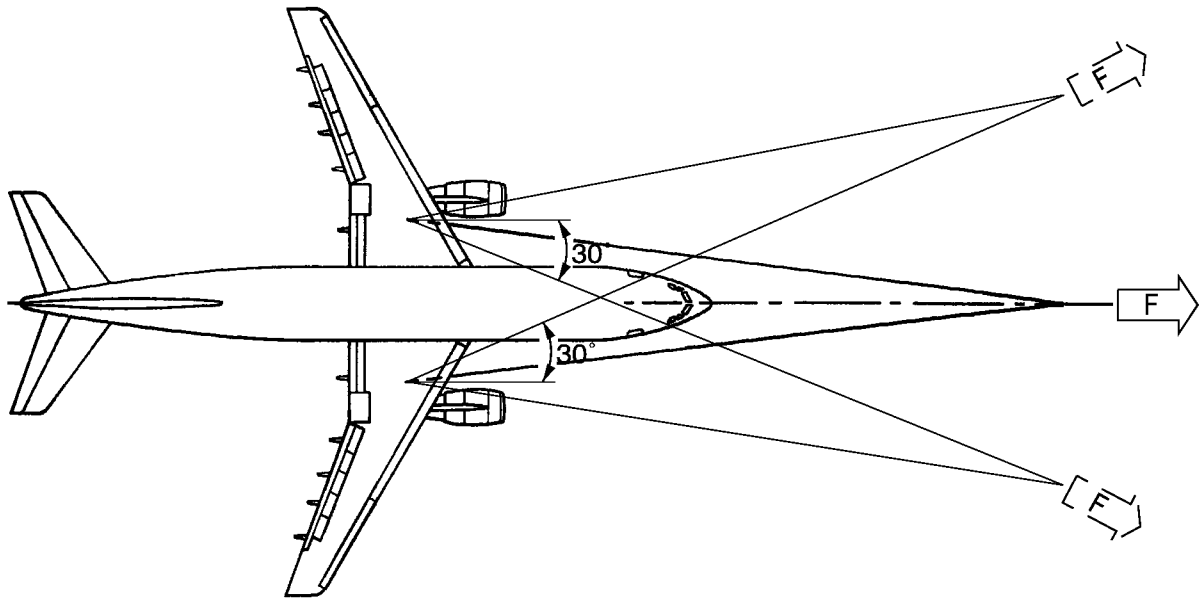
TOWING FORCES F	
BREAKAWAY	6% MTW
ROLLING	3% MTW
BREAKAWAY ON SLOPE	6% MTW +1% MTW PER 1% SLOPE
ROLLING ON SLOPE	3% MTW +1% MTW PER 1% SLOPE

MTW: MAXIMUM TAXI WEIGHT

VERTICAL PLAN



HORIZONTAL PLAN



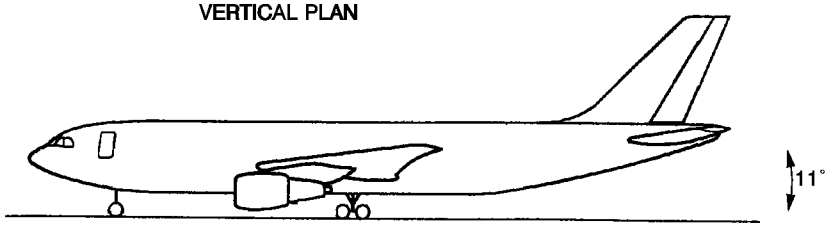
BM5 09 11 00 0 BRM0 02

R Towing with the Main Landing Gear from the Front
Figure 032

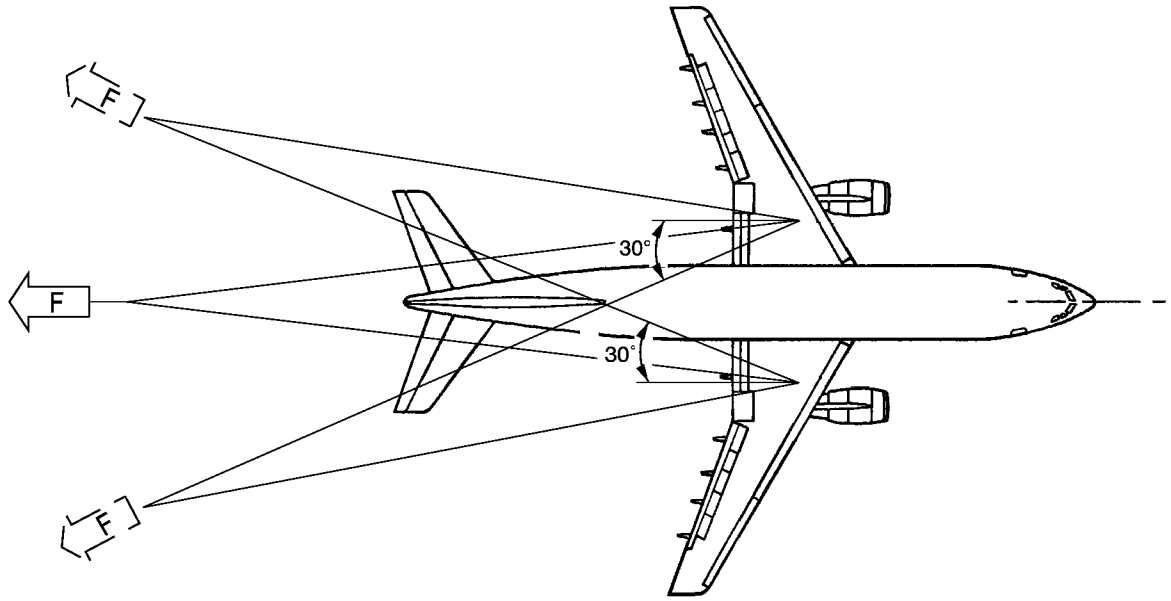
TOWING FORCES F	
BREAKAWAY	6% MTW
ROLLING	3% MTW
BREAKAWAY ON SLOPE	6% MTW +1% MTW PER 1% SLOPE
ROLLING ON SLOPE	3% MTW +1% MTW PER 1% SLOPE

MTW: MAXIMUM TAXI WEIGHT

VERTICAL PLAN



HORIZONTAL PLAN



BM5 09 11 00 0 LKM0 00

R Towing with the Main Landing Gear from the Rear
Figure 033

A. Visual Inspection
(1)When you have completed the towing operation, make sure that the nose wheels are aligned with the aircraft centerline.
(2)De-energize the aircraft electrical network.
(a)De-energize the aircraft electrical network (Ref. 24-41-00, P. Block 301).
(b)If you energized with the APU:
- de-energize the aircraft electrical network (Ref. 24-23-00, P. Block 301).
(c)If you energized with the engine:
- stop engine 2 (Ref. 80-00-00, P. Block 301).
(3)Position wheel chocks.
(4)Disconnect the CABLE, TOWING-MLG (98F09103500000) from the forward fittings or the aft fittings of the landing gear and from the tractor.
(5)Remove the BAR-STEERING, NOSE WHEEL (98A09001001000) from the front fitting of the nose landing gear.
(6)Make sure that the work area is clean and clear of tools and other items.
(7)Apply parking brake.
(8)Remove safety pin and ensure that control lever is in normal position.

TAXIING

1. Taxiing

WARNING : WHEN THE AIRCRAFT IS TAXIING, IT IS OF VITAL IMPORTANCE THAT PERSONNEL KEEP AT DISTANCES SUCH THAT ANY RISK OF ACCIDENT IS AVOIDED
CARE MUST ALSO BE EXERCISED TO CLEAR AWAY ANY OBJECTS LIABLE TO BE BLOWN AWAY OR SUCKED IN BY THE ENGINE

WARNING : DURING TOWING/TAXIING OPERATIONS (LOW-SPEED OPERATIONS INCLUDED), EACH PERSON IN THE AIRCRAFT MUST BE IN A SEAT AND THE SEAT BELT MUST BE FASTENED.
IF THE SEAT BELT IS NOT FASTENED, THERE IS A RISK OF INJURY IF THE AIRCRAFT STOPS SUDDENLY.

CAUTION : TAXIING THE AIRCRAFT WITH ENGINE COWLINGS OPEN IS SPECIFICALLY FORBIDDEN DUE TO POSSIBILITY OF DAMAGE TO COWLS AND NACELLE STRUCTURE.
ALL COWLS (FAN, REVERSER AND CORE) MUST BE CLOSED AND LATCHED, PRIOR TO TAXIING.

NOTE : This task contains aircraft/engine data related to taxiing of the aircraft by maintenance personnel. The operators must refer to their local/airport regulations and use these data to obey them.

(Ref. Fig. 001)

**ON A/C 101-200,

2. Dangerous Areas

A. Engine exhaust and exhaust temperature areas depending on aircraft configuration
(Ref. Fig. 002, 003, 004)
(Ref. Fig. 005, 006, 007)

B. Engine danger areas: exhaust and suction (Ref. Fig. 008, 009)

C. Zones Requiring Use of Ear-Protection Headsets
(Ref. Fig. 010)

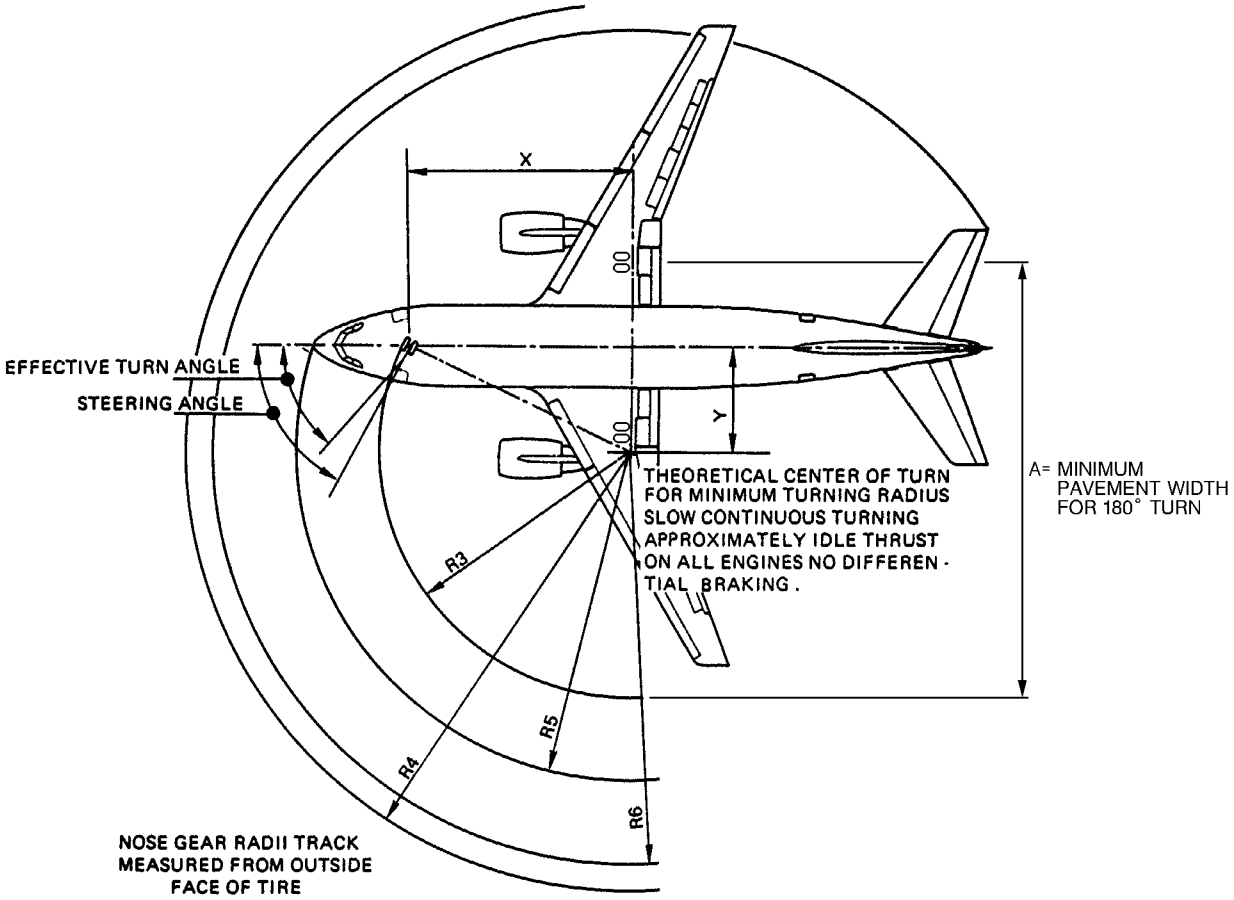
**ON A/C 001-100,

2. Dangerous Areas

A. Engine exhaust and exhaust temperature areas depending on aircraft configuration
(Ref. Fig. 011, 012, 013)
(Ref. Fig. 015, 016, 014)

B. Engine danger areas: exhaust and suction (Ref. Fig. 017, 018)

C. Zones Requiring Use of Ear-Protection Headsets

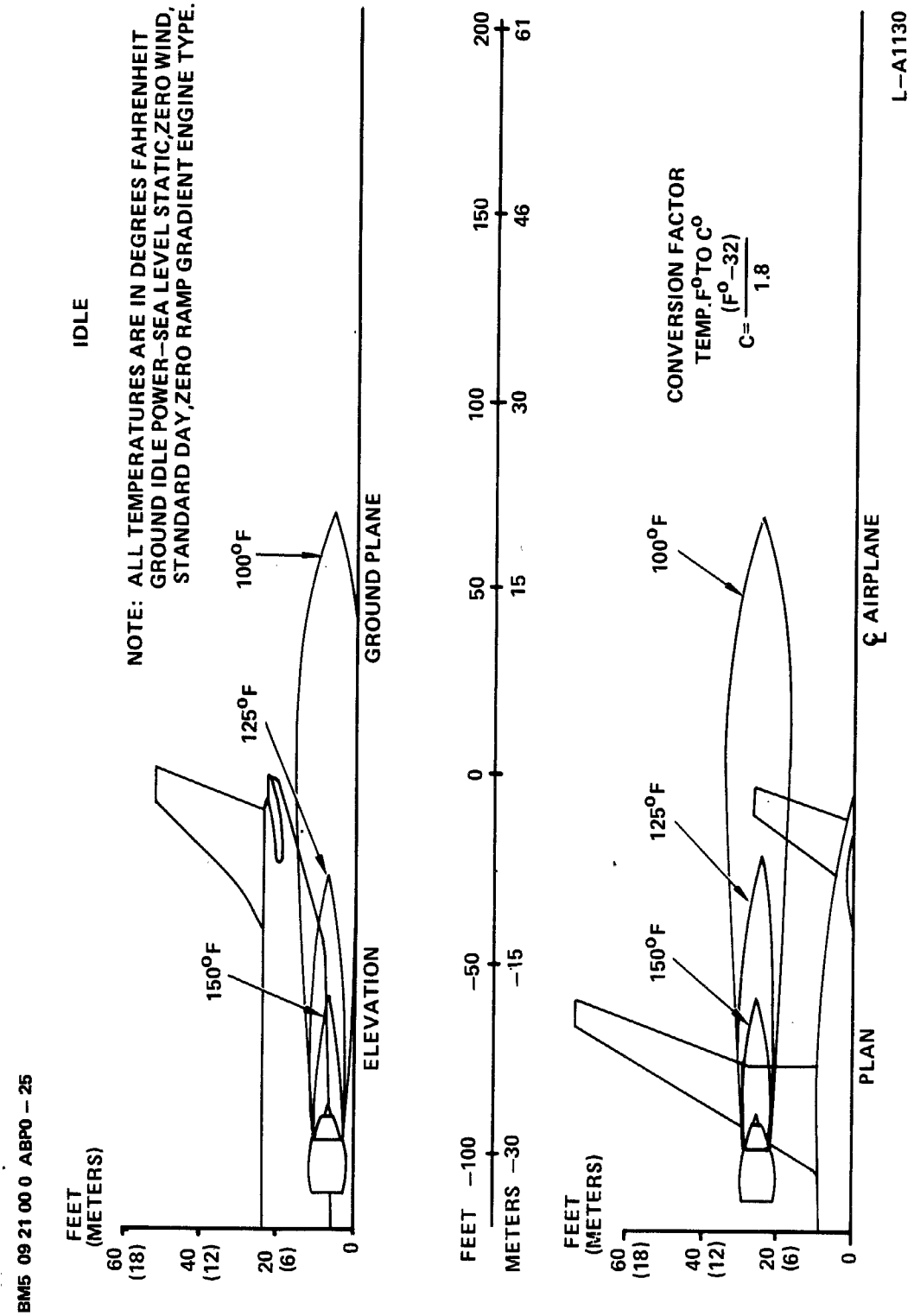

X
Y
EFFECTIVE TURN ANGLE
STEERING ANGLE
THEORETICAL CENTER OF TURN FOR MINIMUM TURNING RADIUS SLOW CONTINUOUS TURNING APPROXIMATELY IDLE THRUST ON ALL ENGINES NO DIFFEREN - TIAL BRAKING .
A= MINIMUM PAVEMENT WIDTH FOR 180° TURN
R3
R4
R5
R6
NOSE GEAR RADII TRACK MEASURED FROM OUTSIDE FACE OF TIRE

C.G. A/C	EFFECTIVE TURN ANGLE	X	Y	A	R3	R4	R5	R6
18 %	60 . 2°	50 . 9Ft 15.51m	28.8Ft 8.77m	105.4Ft 32.13m	58.6Ft 17.87m	103.2Ft 31.47m	77.4Ft 23.58m	97.8Ft 29.80m
35 %	55 . 8°	50.9Ft 15.51m	34.2Ft 10.41m	113.7Ft 34.65m	61.5Ft 18.75m	108.2Ft 32.97m	79.5Ft 24.24m	100.9Ft 30.76m

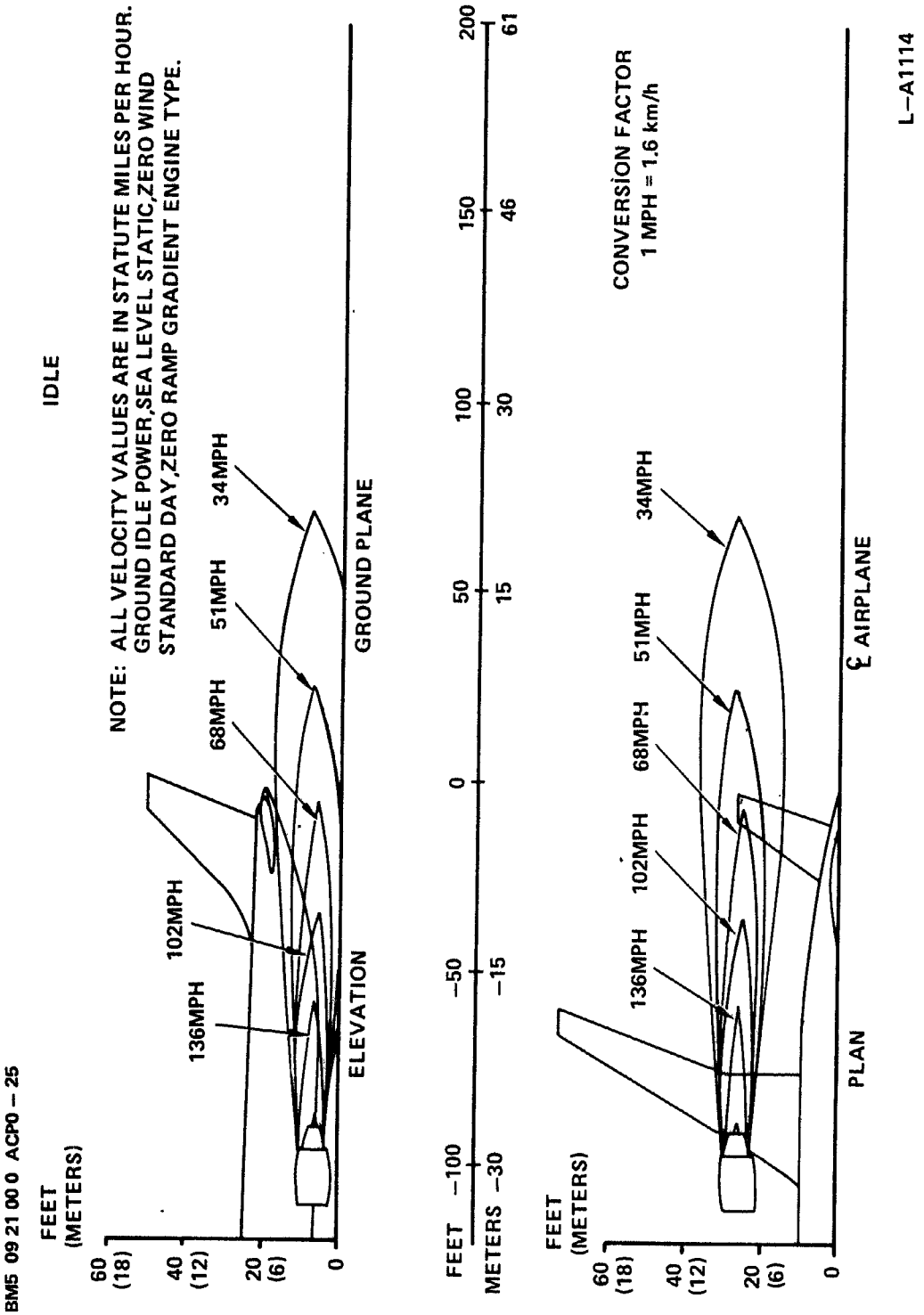
BM5 09 21 00 0 AAM0 01

Minimum Turning Radii
Figure 001

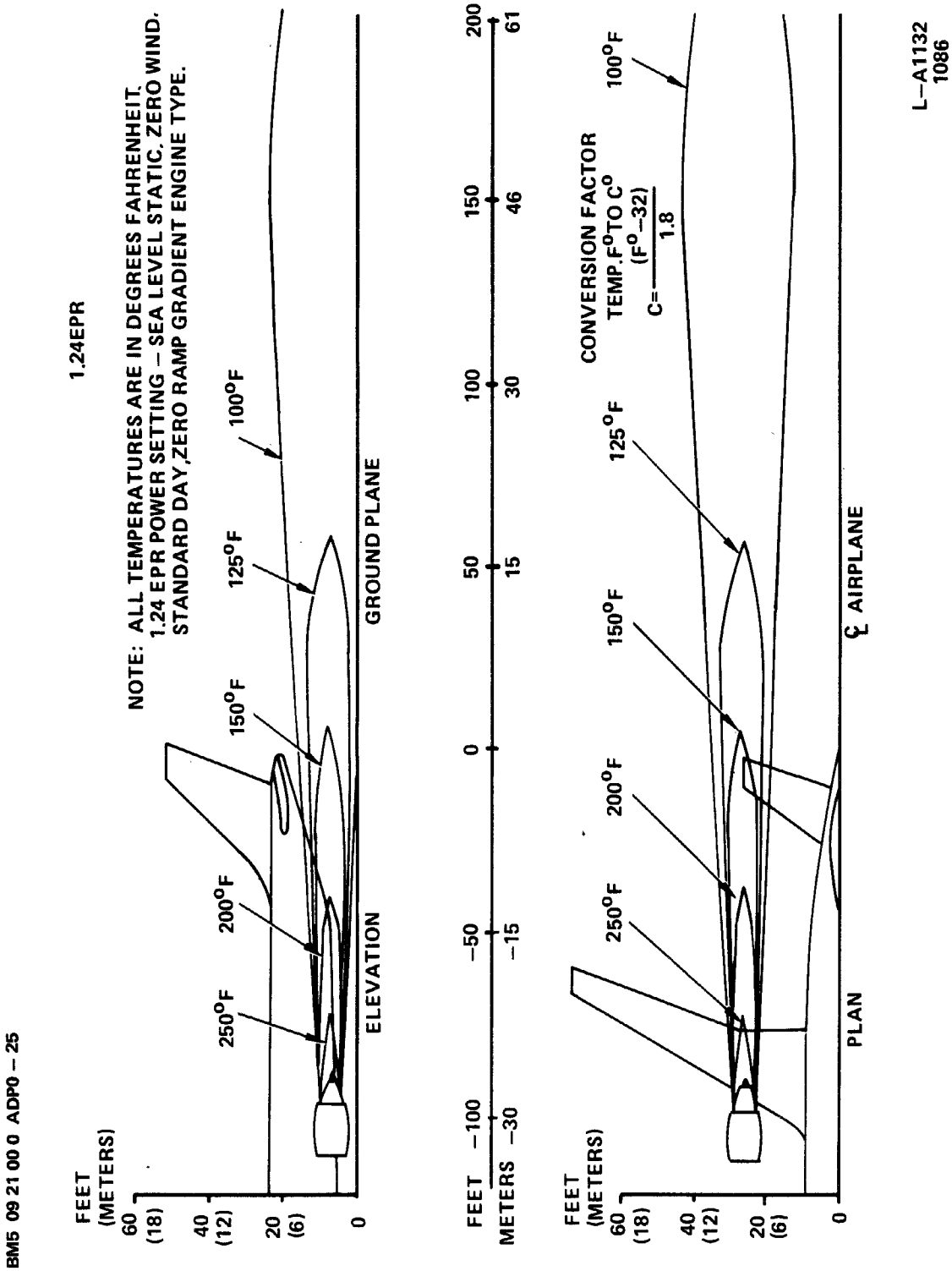
R



Jet Engine Exhaust Temperature Ground Idle Power
Figure 002

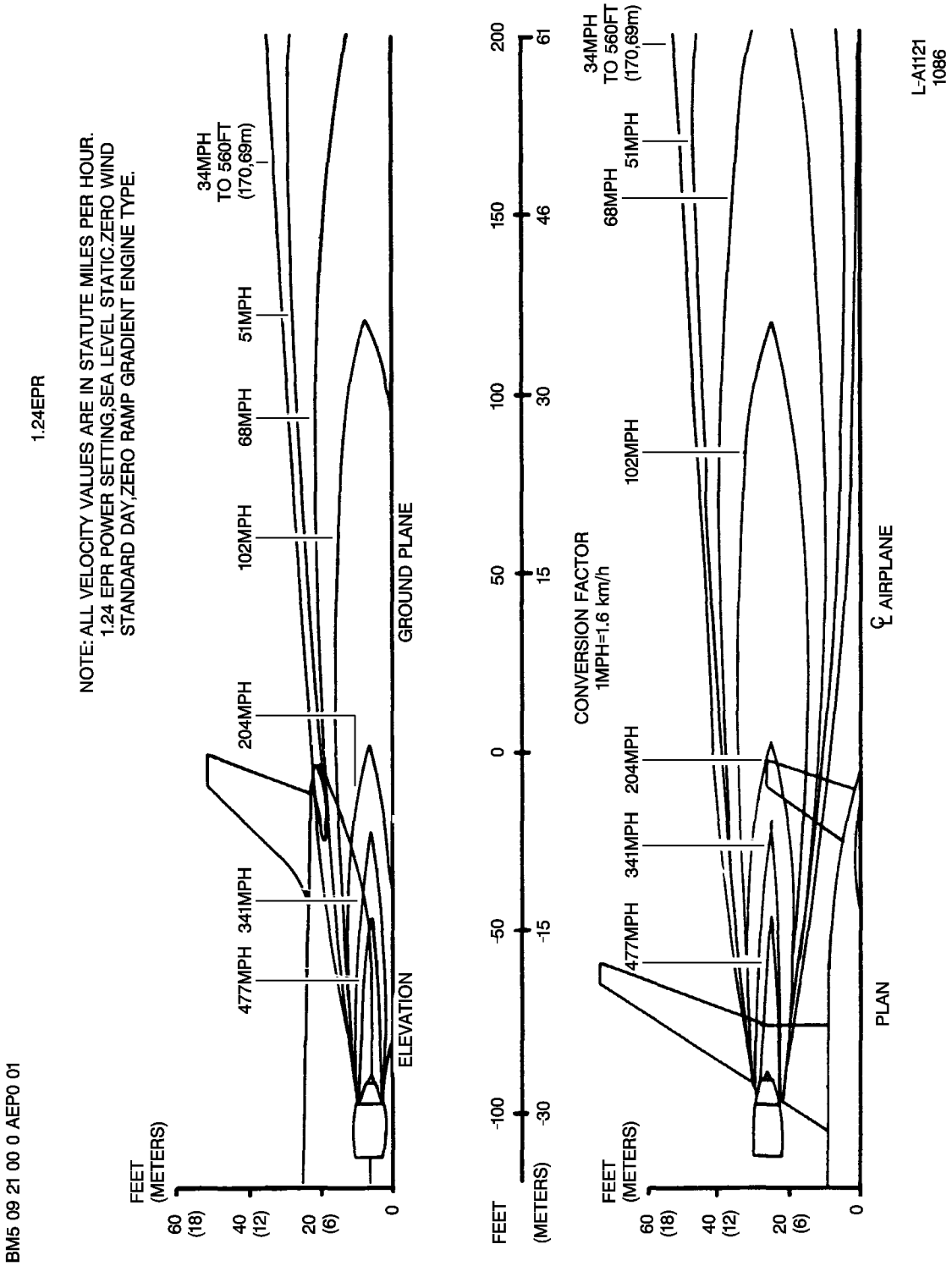


Jet Wake Diagram - Ground Idle Power
Figure 003

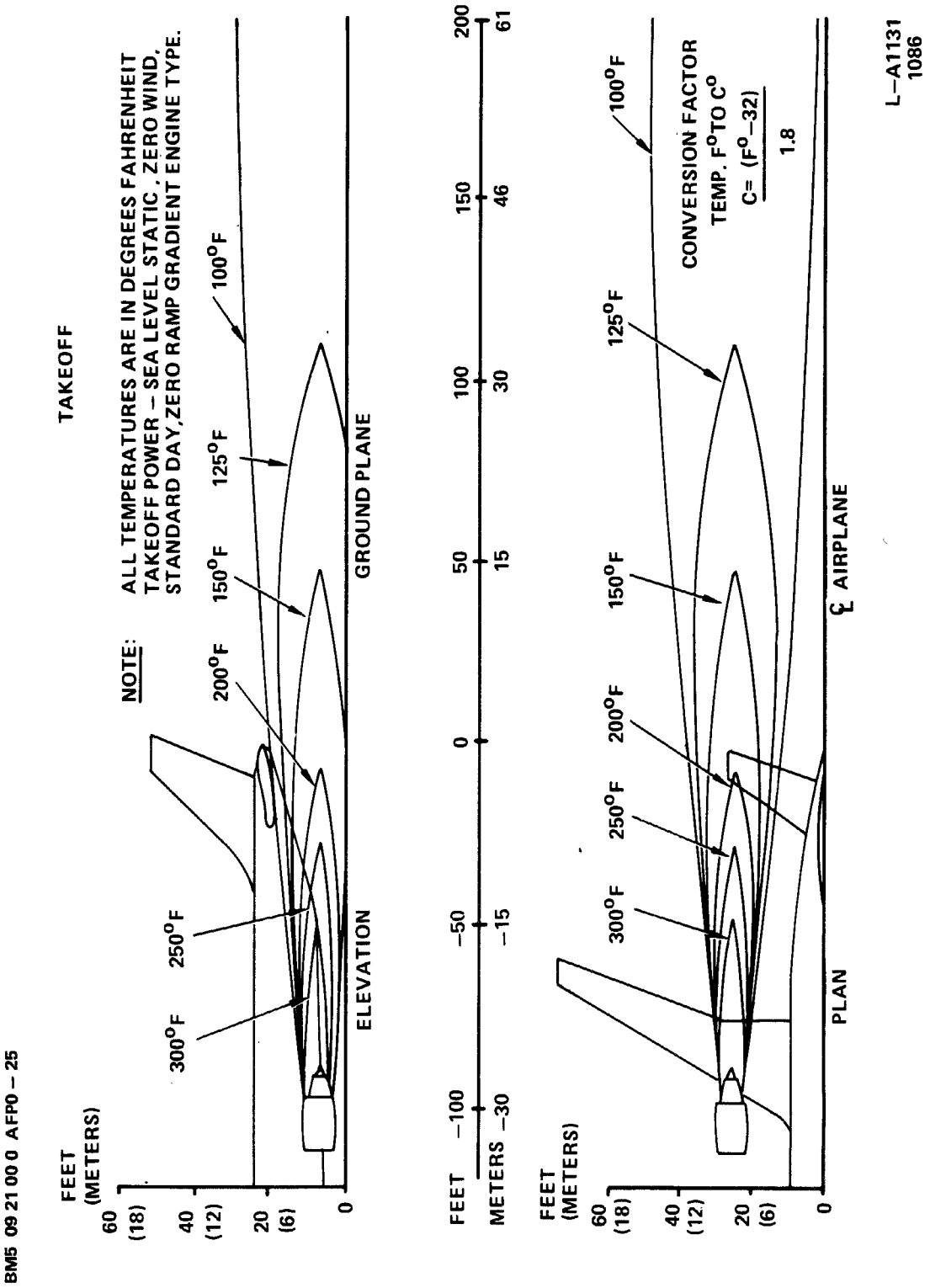


BM5 09 21 00 0 ADP0 – 25

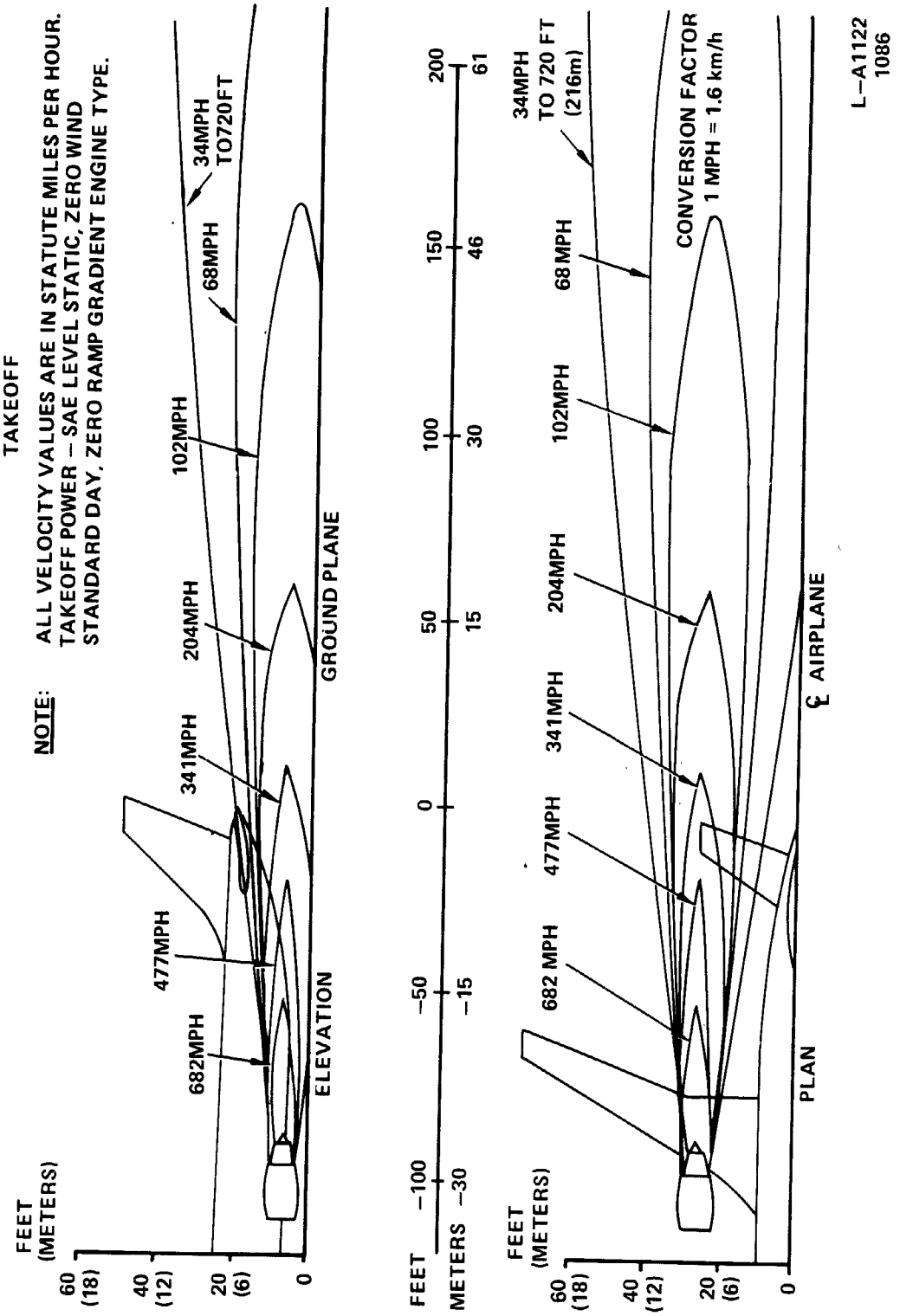
Jet Engine Exhaust Temperature Breakaway
Figure 004



Jet Wake Diagram Breakaway
Figure 005

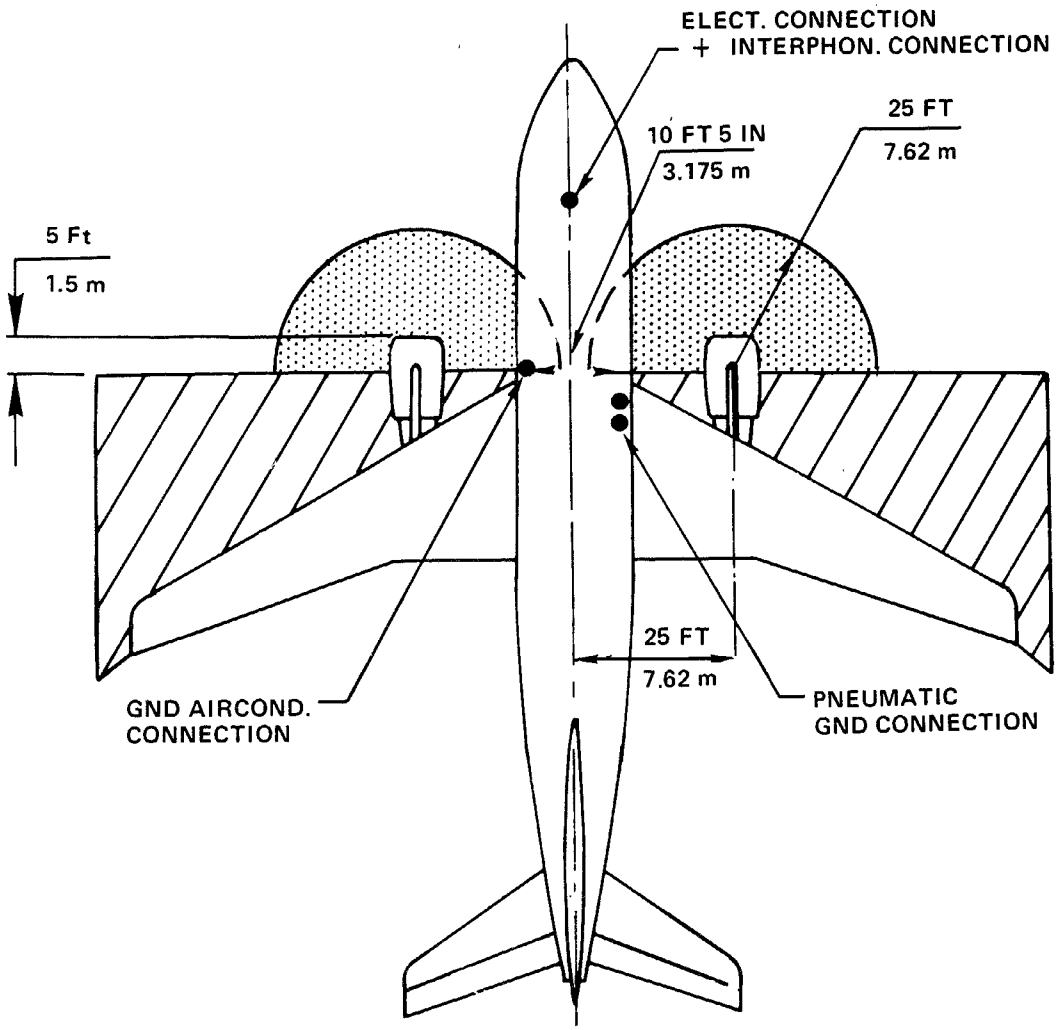


Jet Engine Exhaust Temperature Take-Off Power
Figure 006



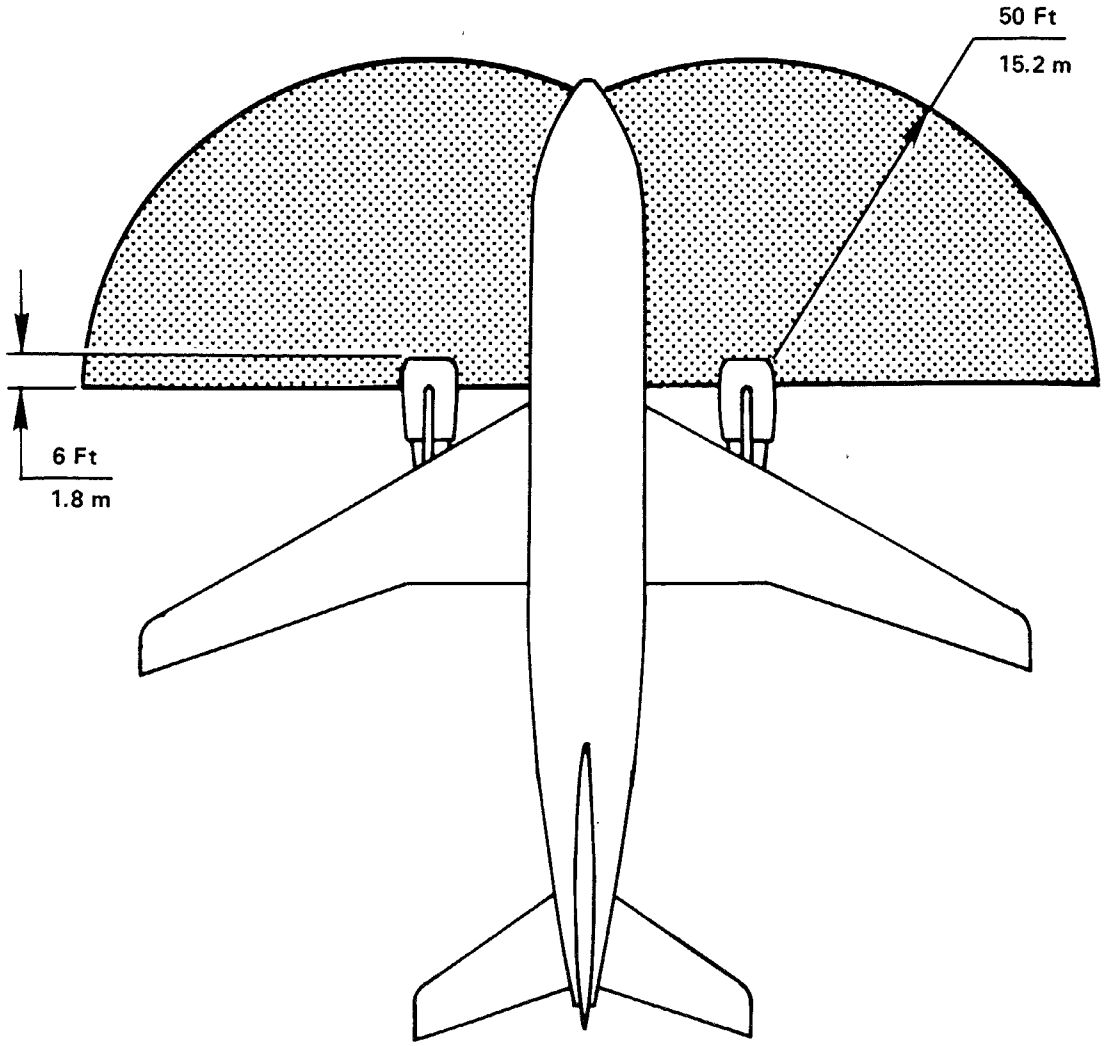
BM5 09 21 00 0 AGP0 – 25

Jet Wake Diagram Take-Off Power
Figure 007



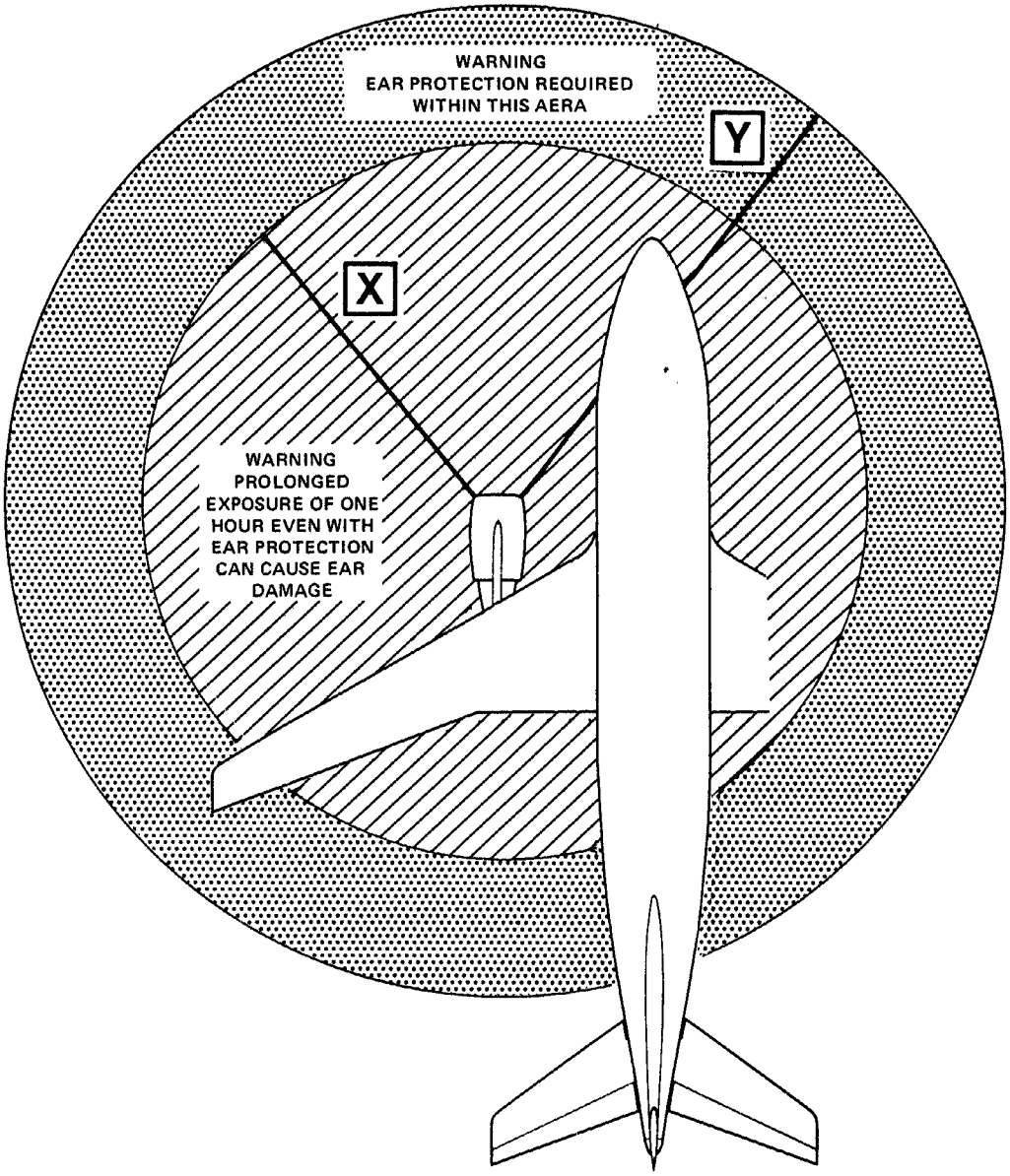
BM5 09 21 00 0 AHP0 – 25

Engine Danger Areas (Ground Idle)
Figure 008



BM5 09 21 00 0 AJP0 – 25

Engine Danger Areas (Take-Off Thrust)
Figure 009

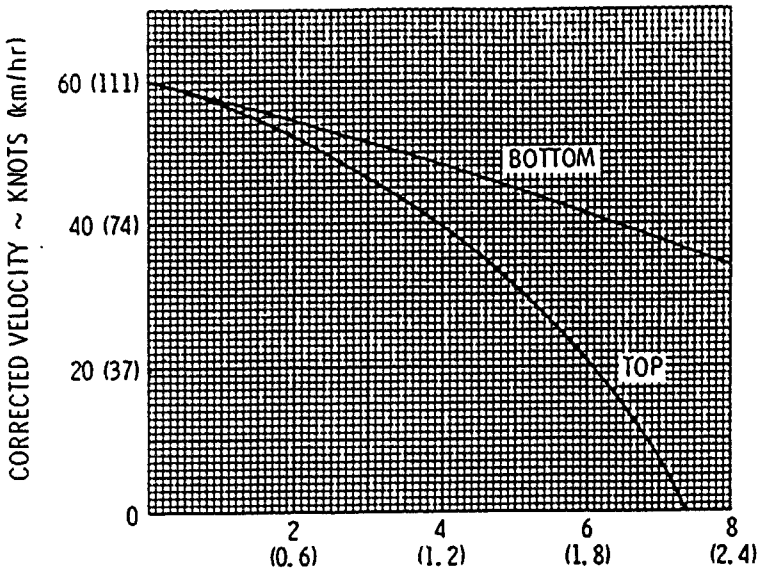


POWER SETTING	RADIUS X	RADIUS X
GROUND IDLE	75 Ft (23 m)	100 Ft (30 m)
BREAK AWAY	90 Ft (27 m)	115 Ft (35 m)
TAKE-OFF	125 Ft (38 m)	200 Ft (60 m)

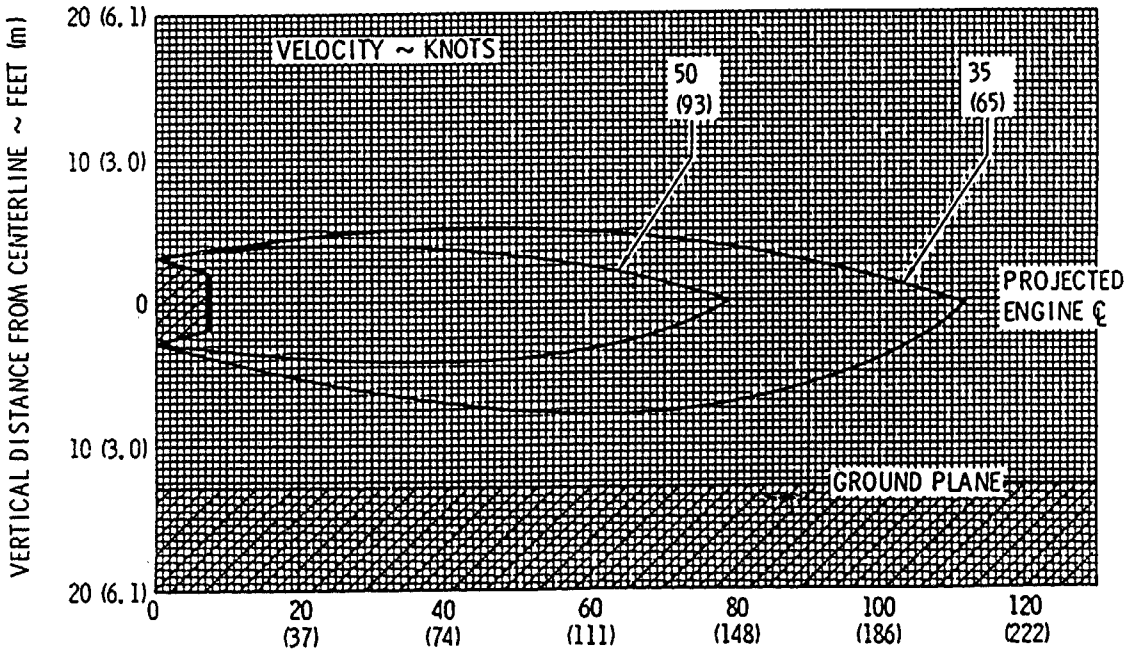
BM5 09 21 00 0 AKMO – 17

Acoustic Protection Areas
Figure 010

MINIMUM IDLE



VELOCITY RADIAL VARIATIONS 61 FEET (18.59 m)
AFT OF FAN NOZZLE EXIT

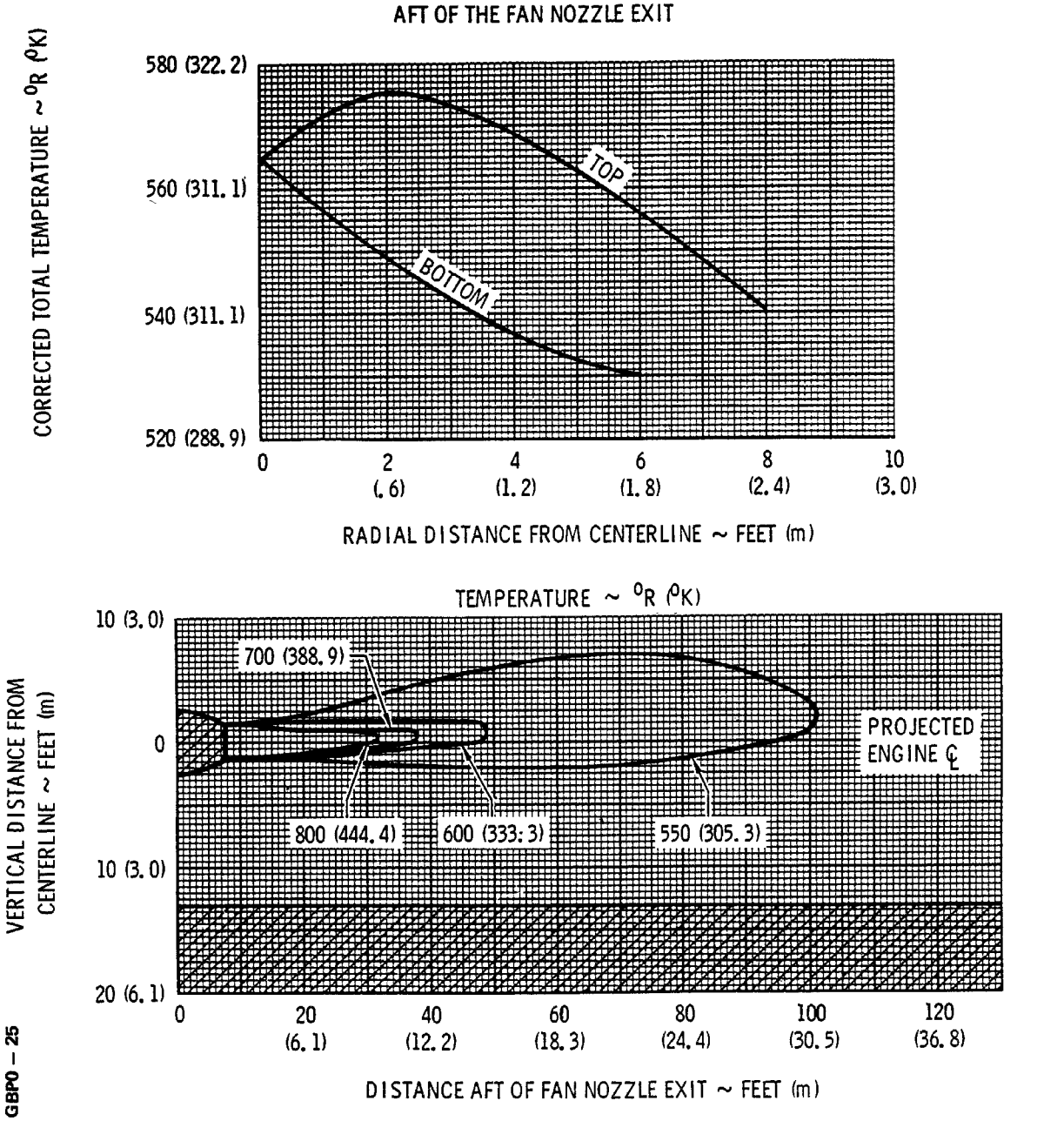


PLUME VELOCITY PROFILE FOR
MINIMUM IDLE POWER SETTING

CF8-8033-0-A2A

BM5 09 21 00 0 GAPO – 25

Jet Engine Exhaust Temperature Ground Idle Power
Figure 011

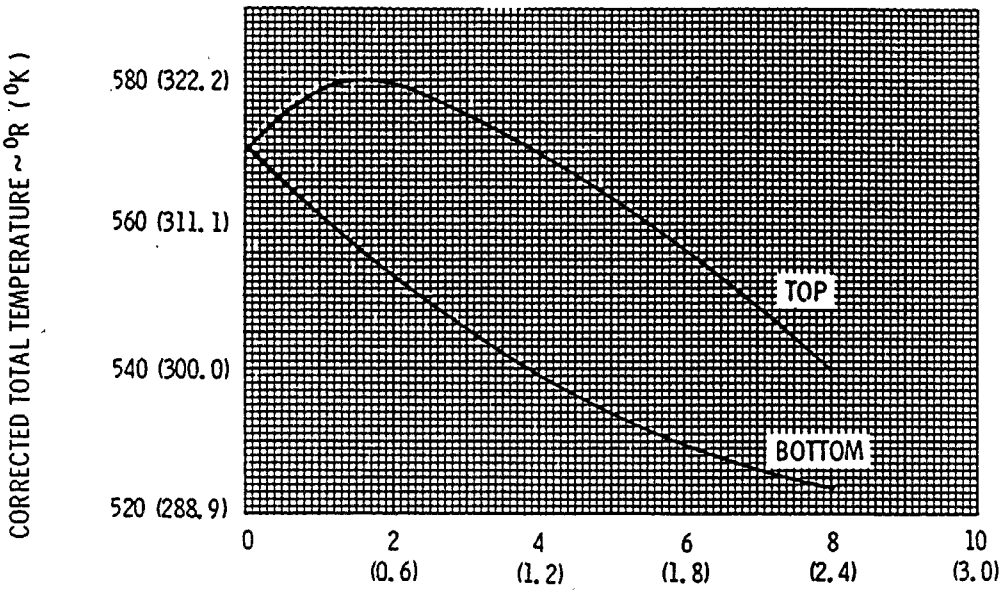


PLUME CORRECTED TOTAL
TEMPERATURE PROFILE FOR
MINIMUM IDLE POWER SETTING

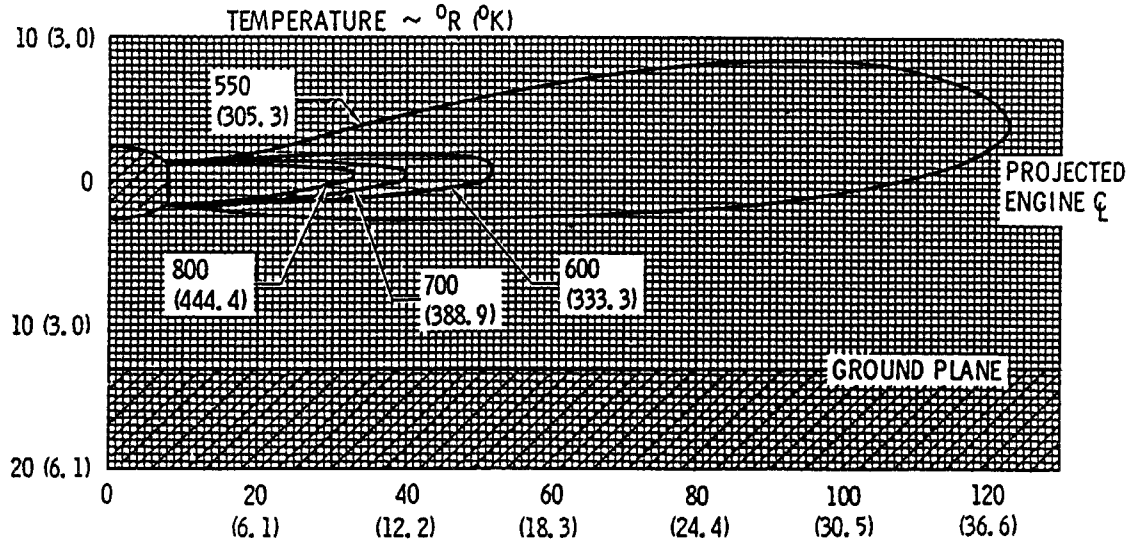
CF8-8041-0-A2A

BM5 09 21 00 0 GBPO - 25

Jet Wake Diagram - Ground Idle Power
Figure 012



CORRECTED TOTAL TEMPERATURE RADIAL VARIATIONS
61 FEET (18.59) AFT OF THE FAN NOZZLE EXIT

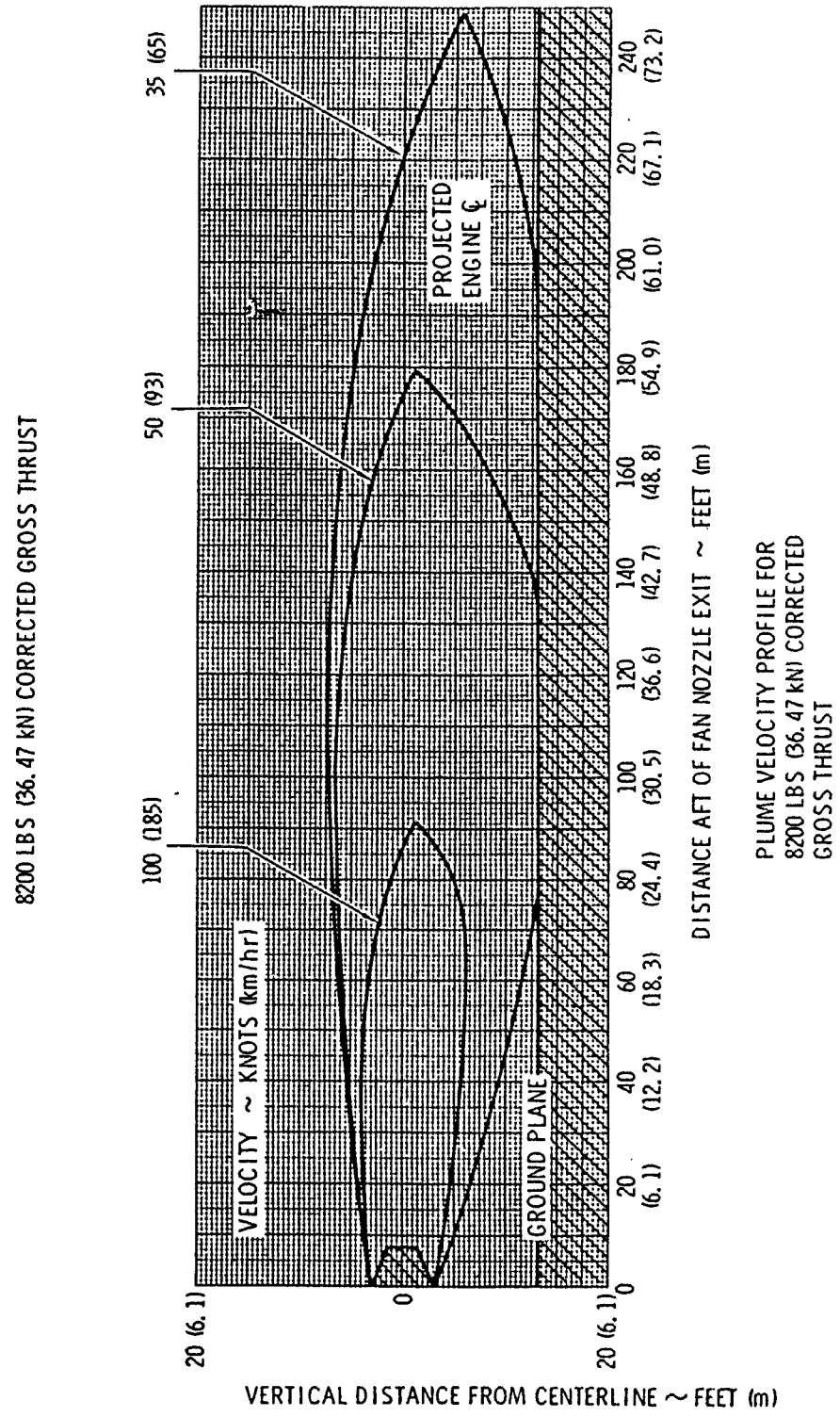


PLUME CORRECTED TOTAL TEMPERATURE PROFILE FOR
8700 LB. (38.70 KN) CORRECTED GROSS THRUST

CF8-8038-0-A2A

BM5 09 21 00 0 GCP0 – 25

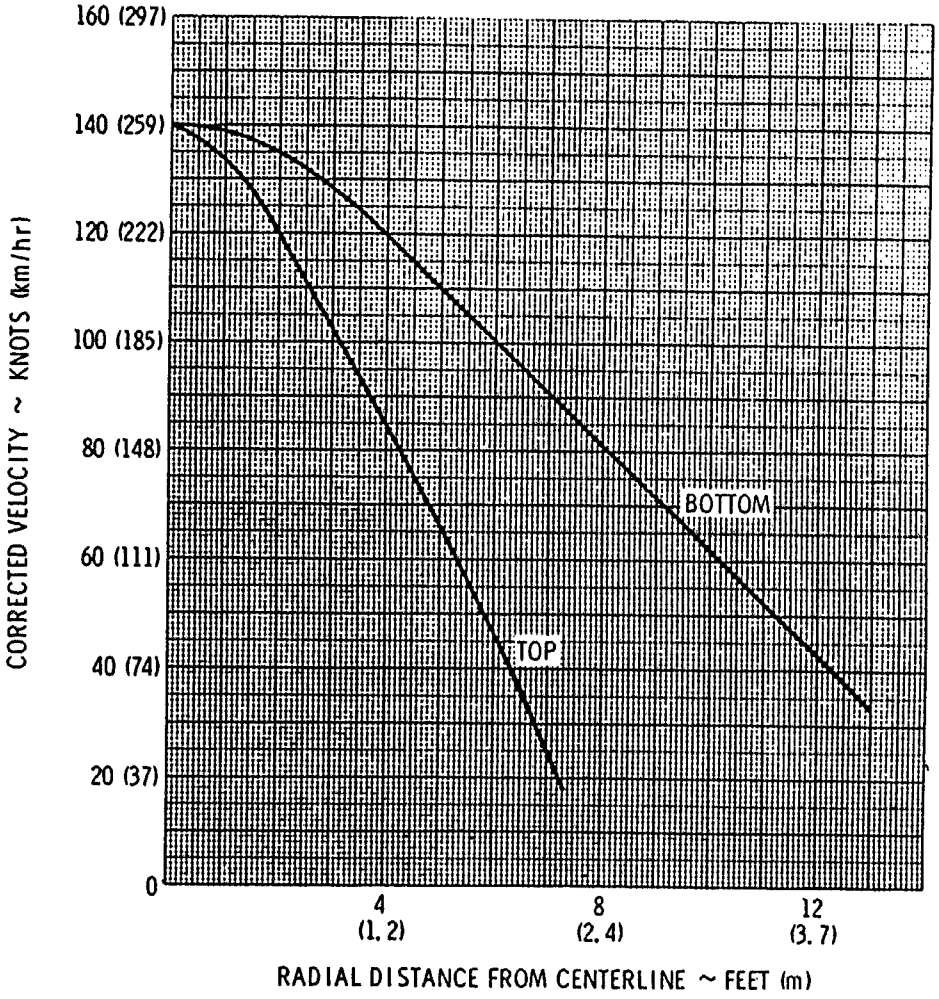
Jet Engine Exhaust Temperature Breakaway
Figure 013



BM5 09 21 00 0 GEPA – 26

Jet Wake Diagram Breakaway (Sheet 1/3)
Figure 014

8200 LBS (36.47 kN) CORRECTED GROSS THRUST

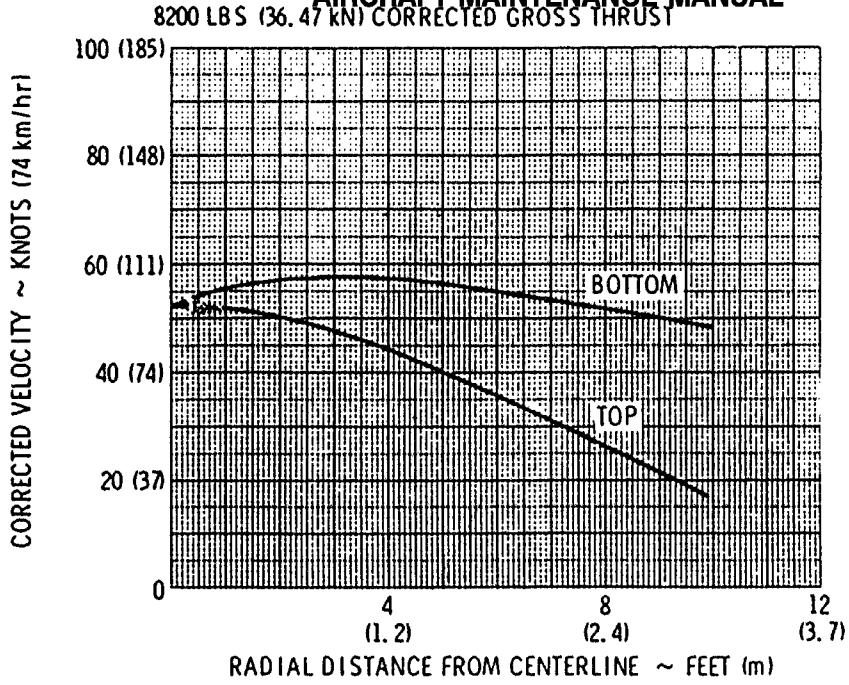


VELOCITY RADIAL VARIATIONS
61 FEET (18.59) AFT OF FAN
NOZZLE EXIT

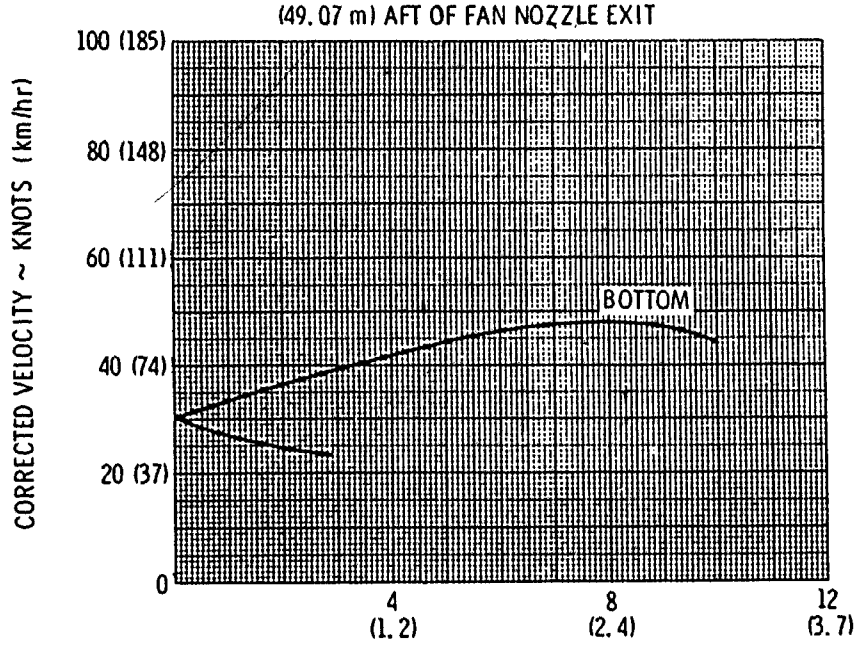
BM5 09 21 00 0 GEPB – 26

CF8-8052-0-A2A

Jet Wake Diagram Breakaway (Sheet 2/3)
Figure 014



VELOCITY RADIAL VARIATIONS 161 FEET
(49.07 m) AFT OF FAN NOZZLE EXIT

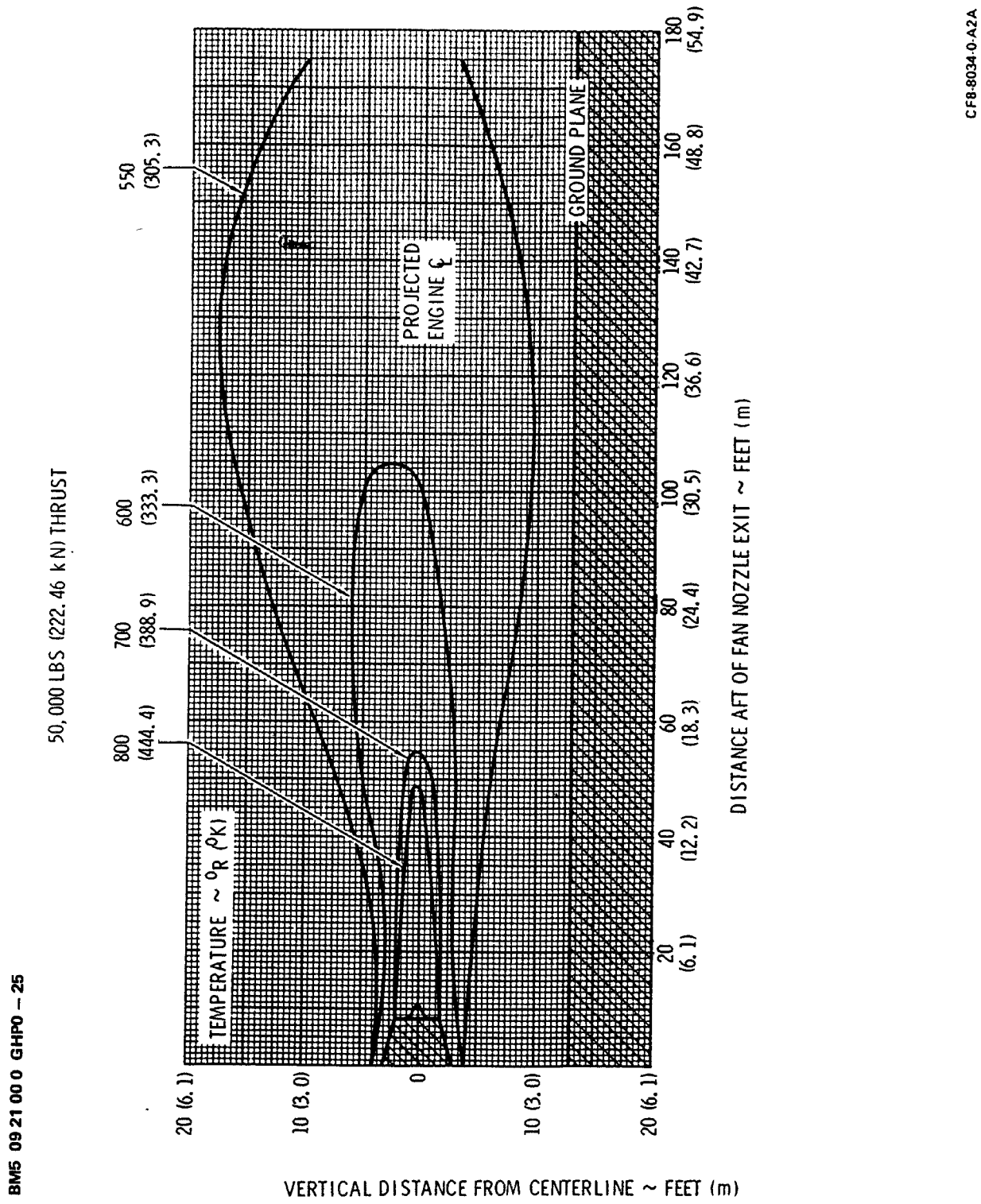


VELOCITY RADIAL VARIATIONS 200 FEET
(60.96 m) AFT OF FAN NOZZLE EXIT

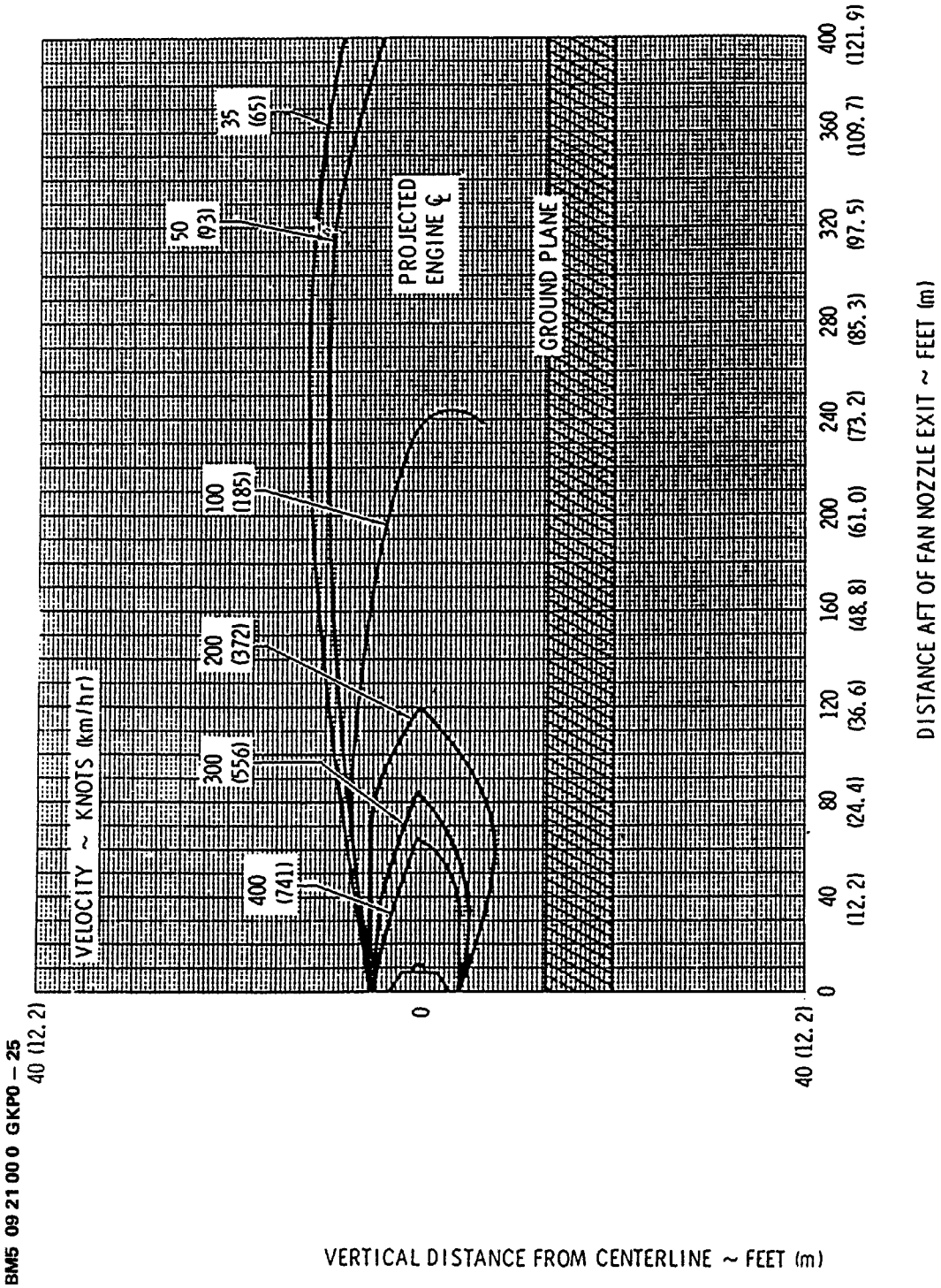
CF8-8060-0-A2A

BM5 09 21 00 0 GEPC – 26

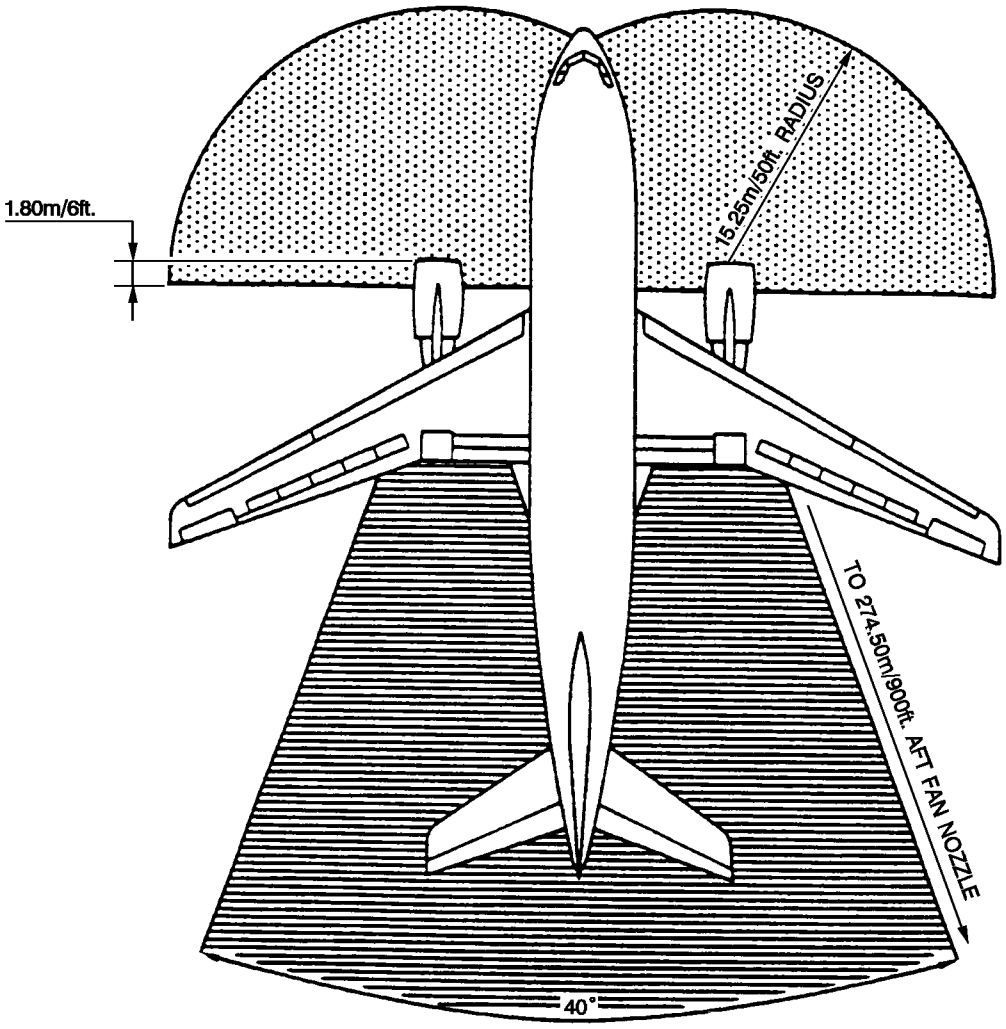
Jet Wake Diagram Breakaway (Sheet 3/3)
Figure 014



Jet Engine Exhaust Temperature Take-Off Power
Figure 015



Jet Wake Diagram Take-Off Power
Figure 016



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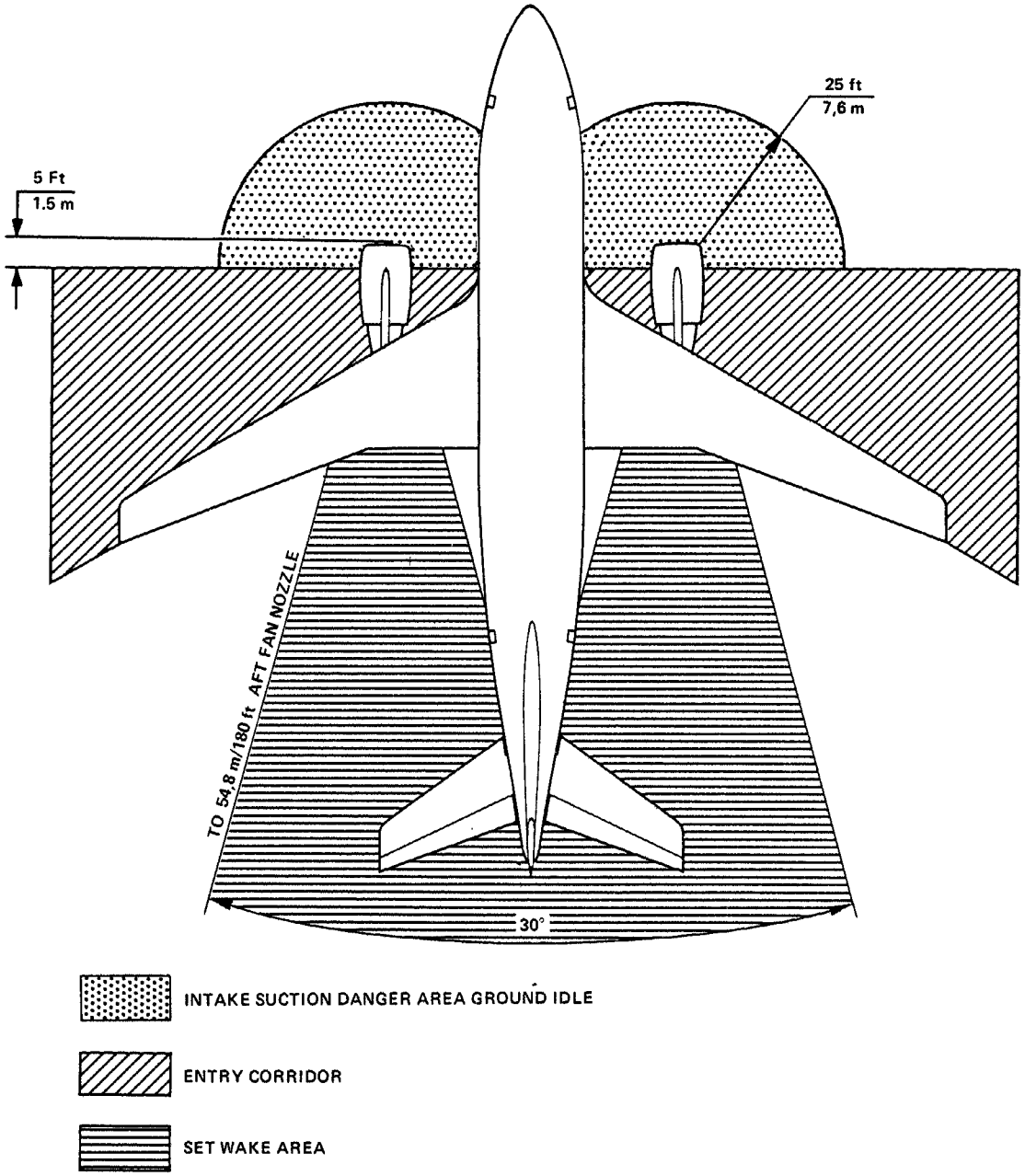
Engine Danger Areas (Take-Off Thrust)
Figure 017



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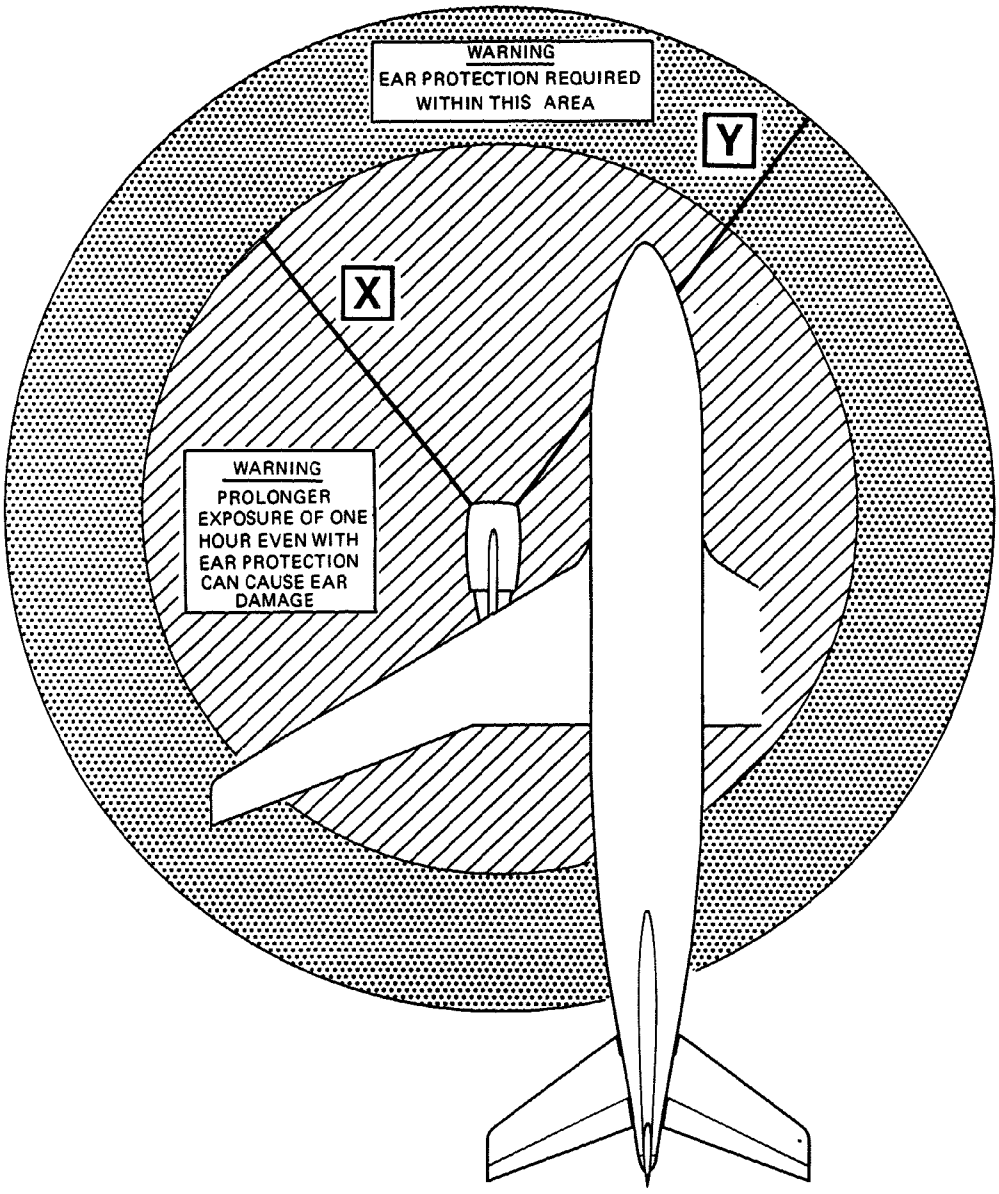
Engine Danger Areas (Ground Idle)
Figure 018

(Ref. Fig. 019)



POWER SETTING	RADIUS X	RADIUS Y
GROUND IDLE	23m (75 ft.)	30m (100. ft)
BREAK AWAY	30m (100 ft.)	46m (150 ft.)
TAKE - OFF	30m (100 ft.)	61m (600 ft.)

NOTE : BASED ON UNINSTALLED ENGINE

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Acoustic Protection Areas
Figure 019

TAXIING OR TOWING WITH TIRES DEFLATED

1. General

Movement of the aircraft with one or several tires deflated on one or more landing gears imposes limitations on taxiing speed and nose wheel steering.
Two methods are considered :
- taxiing using both engines
- conventional towing.

R NOTE : This task contains aircraft/engine data related to taxiing of the
R aircraft by maintenance personnel. The operator must refer to their
R local/airport regulations and use these data to obey them.

2. Taxiing Using Both Engines

(Ref. Fig. 001)

A. Maximum of two tires are deflated on each main gear (one per axle) and/or one tire is deflated on the nose landing gear:
(1)If the nose gear steering angle is less than 20°, the aircraft speed must not be more than 20 Kt.
(2)If the nose gear steering angle is 20° or more, the aircraft speed must not be more than 10 Kt.

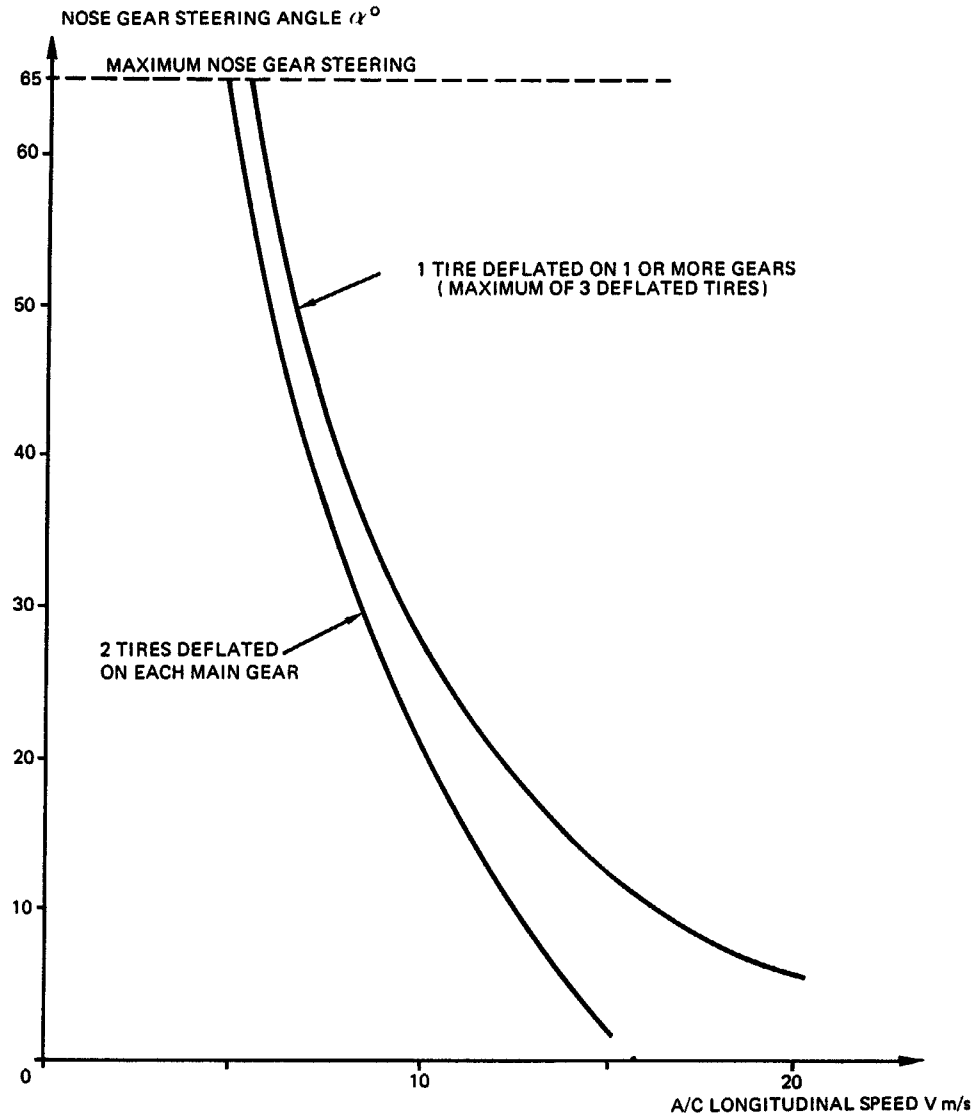
B. Three tires are deflated on the same main gear:
(1)Nose gear steering angle is limited to ± 50°.
(2)Aircraft speed must not be more than 10 Kt.

C. All four tires are deflated on the same main gear:
Nose wheel steering is not permitted.

3. Towing

A. Any one tire deflated on one or more gears (a maximum of three deflated tires).
Towing by nose gear.
(1)Both nose gear tires inflated
Maximum deflection of towbar ± 40°
(2)One nose gear tire deflated
Maximum deflection of towbar ± 10°

B. Two or more tires deflated on the same main gear.
In such case, the aircraft shall be towed by the main gears and steered by the nose gear using the towbar or normal steering control.
(1)Three tires deflated on the same gear
Maximum nose gear steering angle ± 50°
(2)All four tires deflated on the same main gear
No deflection whatsoever of the towbar is permitted.



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Maximum Permissible Nose Wheel Steering Angle Versus
Aircraft Speed
Figure 001